

International School of Lyon

High School Curriculum Guide 2023-24

(Version1)

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Our Vision

‘BUILDING OUR BEST SELVES!’

Our Mission

To develop curious, responsible and independent lifelong learners who actively help to shape their diverse communities.

ISL Values and Guiding Principles:

- *Providing a safe, supportive and nurturing environment*
- *Emphasising the values of respect, integrity and compassion*
- *Encouraging high expectations through individual and collective goal setting*
- *Developing independent, creative and critical thinkers who communicate effectively in more than one language*
- *Implementing internationally recognised and transferable English medium curricula which prepare students for higher education world wide*
- *Using a wide range of proven teaching and learning strategies*
- *Fostering active involvement in local, host country and international communities*
- *Working collaboratively with parents, families and other partners*
- *Promoting global awareness and the need to protect our planet*
- *Encouraging a balanced and healthy lifestyle*

The following pages give a summary of how we expect our students to progress and develop in the course of their studies at the International School of Lyon.

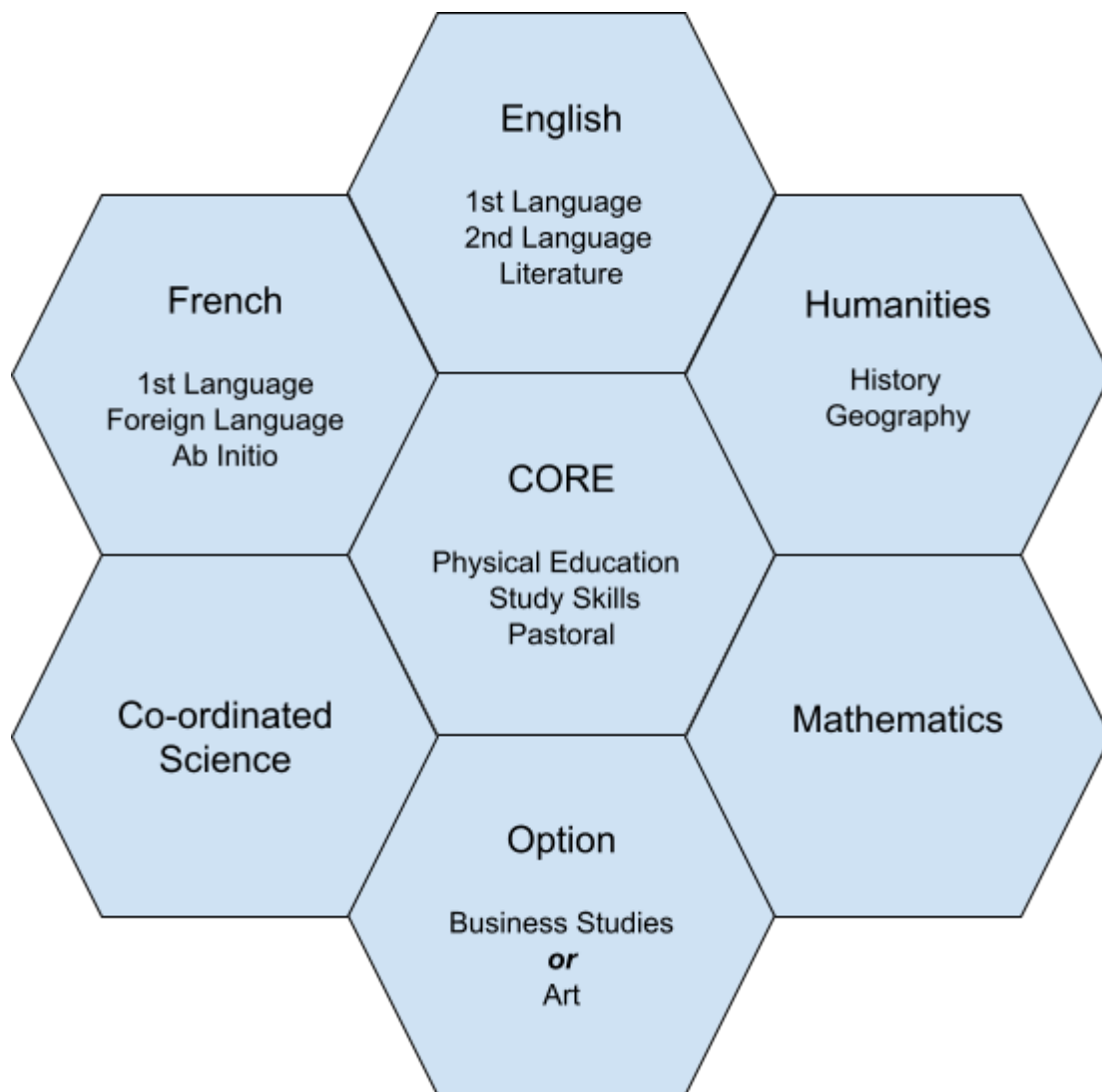
In Grade 9 and 10 all students study the Cambridge International Examinations IGCSE syllabus. Those students having completed the full two years of the IGCSE courses are obliged to take the IGCSE examinations.

In the last two years of high school, students are enrolled in the IB Diploma programme, an academically challenging course leading to a universally recognized university access qualification, the IB Diploma.

Overview of the IGCSE Programme

IGCSE Grades 9-10

Students in Grades 9-10 follow a broad, balanced curriculum comprising English as a first language (including Literature), French as a first or foreign language, Coordinated Science, Mathematics, History, Geography, Business Studies or Art, and Physical Education. Pastoral issues are covered during the Homeroom periods and Pastoral lessons. ESOL (English as a Second or Other Language) is offered to those who require additional English support. ICT (Information and Communication Technology) skills are developed in all areas of the curriculum. The curriculum model for Grades 9–10 is set out below:



The curriculum is based on the IGCSE (**International General Certificate of Secondary Education**) programme, which is administered by the University of Cambridge and recognised world-wide as a major educational qualification at the end of Grade 10. This is designed to encourage high academic

standards through a practical approach to teaching and learning. The guiding principle of IGCSE is that students are rewarded for positive achievement: what they know, understand and can do. It offers a sound base for the IB Diploma Programme.

Grades 9-10

IGCSE Curricula

English Grades 9-10

Nature of the Subject

The course prepares students for the Cambridge IGCSE exams in First Language English **and** English Literature. The curriculum builds on the skills students have developed in Grades 6 -8, reinforcing the student's ability to communicate effectively through written and spoken word and improving literary analysis and commentary skills. Increased fluency, diction and appropriate use of register is aspired to in the written work and the study of literature focuses on interpreting and understanding deeper meanings within fiction and nonfiction texts. **In Grade 9, students prepare for the First Language English exam. In Grade 10, they prepare for the English Literature exam.**

Aims and Objectives of the First Language English course

The course aims to enable students to:

- read a wide range of texts, fluently and with good understanding, enjoying and appreciating a variety of language
- read critically, and use knowledge gained from wide reading to inform and improve their own writing
- write accurately and effectively, using Standard English appropriately
- work with information and with ideas in language by developing skills of evaluation, analysis, use and inference
- listen to, understand, and use spoken language effectively
- acquire and apply a wide vocabulary, alongside a knowledge and understanding of grammatical terminology and linguistic conventions
- communicate accurately, appropriately and effectively in speech and writing

Course Content

The course focuses particularly on reading and writing skills, including the development of vocabulary and the correct use of grammar and spelling. The curriculum offers students a wide range of reading texts, from a variety of genres, eras, backgrounds, and themes. Students use these texts to inform and inspire their own writing, and write in a range of text types for different purposes and audiences. Throughout the curriculum, students are encouraged to read material chosen on their own initiative and to become appreciative and critical readers, writers, speakers and listeners.

Assessment

Assessment is based on a variety of exercises and assignments which focus on reading and writing, skills. The assessment criterion, which varies depending on each specific task, is modelled on the

IGCSE English First Language criteria. It is expected that students will sit the IGCSE English First Language examinations at the end of Grade 9.

Aims and Objectives of the English Literature course

The course aims to enable students to:

- enjoy the experience of reading literature
- understand and respond to literary texts in different forms and from different periods and cultures
- communicate an informed personal response appropriately and effectively
- appreciate different ways in which writers achieve their effects
- experience literature's contribution to aesthetic, imaginative and intellectual growth
- explore the contribution of literature to an understanding of areas of human concern
- listen to, understand, and use spoken language effectively
- acquire and apply a wide vocabulary, alongside a knowledge and understanding of grammatical terminology and linguistic conventions.

Course Content

The syllabus enables learners to read, interpret and evaluate texts through the study of literature in English. Learners develop an understanding of literal meaning, relevant contexts and of the deeper themes or attitudes that may be expressed. Through their studies, they learn to recognise and appreciate the ways in which writers use English to achieve a range of effects, and will be able to present an informed, personal response to the material they have studied. The syllabus also encourages the exploration of wider and universal issues, promoting learners' better understanding of themselves and the world around them.

Assessment

Assessment is based on a variety of exercises and assignments which focus on reading and writing skills. The assessment criterion, which varies depending on each specific task, is modelled on the IGCSE English Literature criteria. It is expected that students will sit the IGCSE English Literature examinations at the end of Grade 10.

ESOL Grades 9-10

Nature of the Subject

The ESOL course at the International School of Lyon prepares students for the Cambridge IGCSE English as a Second Language exams, with a focus on developing skills in listening, speaking, reading, and writing.

Aims and Objectives

The ESOL course enables students to:

- develop a level of fluency necessary for academic success in an English-speaking school
- develop transferable skills to complement other areas of the curriculum
- develop learners' ability to use English effectively for the purpose of practical communication, in a range of situations and contexts
- develop learners' awareness of the nature of language and language-learning skills
- promote learners' personal development and enjoyment of the English language.
- practise writing for different purposes and audiences.
- redraft writing to improve accuracy and quality
- use correct pronunciation and intonation
- build vocabulary needed to communicate complex ideas
- read a range of materials in the target language, both to support learning and for personal interest and enjoyment.
- learn to select relevant details, understand the difference between what is directly stated and implied

Course Content

Because reading and writing skills are fundamental to academic success in secondary school, the course emphasises the building of vocabulary to boost reading comprehension and the accurate use of grammatical structures to improve writing. Students receive individual attention and resource materials including grammar and text books as well as texts from a variety of authentic sources such as newspapers and magazines, short stories and extracts from literary works. Materials are chosen to both challenge students and give them the necessary foundation in English needed to succeed in the IB program of grades 11 and 12.

Assessment

The skills of listening, speaking, reading and writing are assessed through class work, quizzes, tests, written work, oral presentations and participation. Practice IGCSE exams in all four skill areas are a frequent form of assessment as well. Students whose level is adequate are entered to take the IGCSE English as a Second Language examination at the end of Grade 9 or 10.

FRENCH A Grades 9-10

Nature of the subject

The Language A course in French is aimed at students who have a level in the relevant language (French) equivalent to first language competence:

The curriculum builds on the skills students have developed in Grades 6-8, reinforcing the student's ability to communicate clearly, accurately and effectively in writing. Students should also demonstrate the ability to use a wide range of vocabulary, correct grammar, spelling and punctuation with a personal style and an awareness of the audience being addressed.

The course also provides an introduction into literary analysis in view of preparing students for further study in French at IB level.

Aims and objectives

- enable students to communicate accurately, appropriately and effectively in writing
- enable students to understand and respond appropriately to what they read
- encourage students to enjoy and appreciate the variety of language
- complement the students' other areas of study by developing skills of a more general application (e.g. analysis, synthesis, drawing of inferences)
- promote the students' personal development and an understanding of themselves and others.

Content and themes:	
Cycle 2022-23	Cycle 2023-24
<ul style="list-style-type: none">• Le portrait,• Le fantastique,• Comédie et tragédie,• Les médias	<ul style="list-style-type: none">• Le roman gothique• La poésie / le slam• Les nouvelles policières• L'épistolaire

Students also work on grammar, syntax and spelling accuracy.

Exam skills and methodology include: writing an argumentative essay, descriptive and narrative writing, comprehension and analysis questions.

Assessment

Students are assessed regularly in Reading and Writing tasks. These include but are not limited to:

- Past paper questions,

- Creative writing tasks,
- Dictées,
- Literary analysis of books and text excerpts .

FRENCH B Grade 9-10

Nature of the subject

This syllabus is designed for learners who are learning French as a foreign language. The aim is to develop an ability to use the language effectively for purposes of practical communication. The course is based on the linked language skills of listening, reading, speaking and writing, and these are built on as learners progress through their studies.

The syllabus also aims to offer insights into the culture and civilisation of countries where French is spoken, thus encouraging positive attitudes towards language learning and towards speakers of foreign languages.

Students will develop abilities that are necessary for both the IGCSE examination and the DELF B1 examination.

Aims and objectives

- To develop the ability to use the language effectively for purposes of practical communication within the country of residence.
- To form a sound base of the skills, language and attitudes required for further study, work and leisure.
- To offer insights into the culture and civilization of the countries where the language is spoken.
- To encourage fuller integration into the local community.
- To develop a fuller awareness of the nature of languages and language learning.
- To encourage a positive attitude towards foreign languages learning and towards speakers of foreign languages and a sympathetic approach to other cultures and civilizations.
- To begin to develop a common understanding of the cultural patterns that affect the thinking, feeling and acting of the societies in which the language is spoken.
- To encourage students to ask questions, develop their critical thinking and link the study of French with the other subjects and the current world.
- To provide enjoyment and intellectual stimulation.
- To complement other areas of study by encouraging skills of a more general application (analysis, memorization...).

Content and themes:	
Cycle 2022-23	Cycle 2023-24
Home life and school	Accommodation

Food, health and fitness School routine Eating and drinking Personal and social life Holidays, Festivals and special occasions Self, family, pets, personal relationships House and home Leisure, entertainments, invitations Eating out Holidays; getting around The world of work continuing education Careers and employment Language and communication in the workplace The international world	The world around us Home town and local area Natural and made environment People, places and customs Public services Weather Finding the way Meeting people Travel and transport Life in other countries and communities World events and issues Communication Geographical surroundings Shopping Tourism at home and abroad
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The study of grammar, tenses and conjugations will be addressed throughout the course. The subject will largely draw from original resources such as newspaper articles, television broadcasts, internet resources but also French literature.

The students will also do an in-depth study of several books and practice exam skills and methodology relevant to both papers of the IGCSE exam, and the DELF examination.

Assessment

Assessment is a continuous process and four skills are evaluated: listening, speaking, reading and writing.

Homework, projects, class work and participation also form part of the grade. Tests and quizzes are given regularly and a final assessment is given at the end of each year.

FRENCH Ab initio Grade 9-10

Nature of the subject

Language ab initio is a language acquisition course designed to provide students with the necessary skills and intercultural understanding to enable them to communicate successfully in an environment where the language studied is spoken. This process encourages the learner to go beyond the confines of the classroom, expanding an awareness of the world and fostering respect for cultural diversity.

Aims and objectives

- develop the skills of listening, speaking, reading and writing in a range of situations and contexts
- use correct pronunciation and intonation as a means of practical communication
- instill curiosity, interest and enjoyment in the target language
- read a range of materials in the target language, both to support learning and for personal interest and enjoyment

Main content or themes

The presentation of topics will be based on speaking, listening, reading and writing activities with a strong emphasis on oral communication and spelling accuracy. The course covers a variety of topics to allow the learning of a wide range of vocabulary, grammar points and cultural awareness.

Content and themes:	
Cycle 2022-23	Cycle 2023-24
<ul style="list-style-type: none">• introducing oneself & family• physical & moral descriptions• towns, cities & environment• house & bedroom• means of transport• the weather• fashion & shopping• holidays	<ul style="list-style-type: none">• introducing oneself & family• physical & moral descriptions• food & drinks• sports and leisure activities• daily routine & telling the time• school• jobs & pocket money

Assessment

The course assessment is based on student performance in homework, class-work, tests and oral participation. Students will be exposed to a wide range of language activities during the course and are expected to work as a whole class, in smaller groups, in pairs and individually, according to the task. Students are assessed on their competence in the four skills of speaking, writing, reading and listening.

History Grades 9-10

Nature of the subject

The History discipline at the International School of Lyon follows the Cambridge IGCSE 20th Century option B exploring a breadth study on International Relations between 1919 and c1990. A more in depth inquiry of Germany between 1919 and 1945 is also undertaken. The course involves the investigation of significant historical events through various activities such as empathy based role play and drama , analysis of primary and secondary sources, skills of inference, inquiry based learning / research and presentation and an exploration of how we can learn from the events of the past. Active historical inquiry is based on and structured around the following key concepts and skills.

- Historical significance
- Cause and Consequence
- Change and Continuity
- Interpretation and Perspective
- Knowledge and Understanding
- Research
- Critical thinking
- Communication
- Historian's Craft including the Investigation of the nature, purpose and message of source materials and their use and application as evidence

Aims and Objectives

With regard to historical content, the aim of this syllabus is to provide the students with:

- a comparative, international, inter-related sense of the fundamental changes undergone by a variety of countries in the world during the twentieth century as they experienced the wide ranging upheavals that marked the dawning of modernity across the globe
- a chronological understanding and a visual memory of the main events and the major figures involved in those transformations.

With regard to the student's intellectual development, this course aims to:

- develop the student's sense of reasoning in their written work, by enabling them to distinguish fact from interpretation and to form hypotheses supported by evidence;
- to present those hypotheses in the form of a sustained, clearly structured and carefully developed argument;

- to develop and promote a sense of initiative by encouraging the students to pursue independent research using professional archives of primary sources, be they official written and printed documents paper or film archives;
- to stimulate the student's historical curiosity and imagination as well as their creativity by integrating all of this with art and film, by having the students design and produce individual paintings and posters, newspapers and propaganda films.

Course Content

Students beginning the two-year IGCSE in 2022 (Grade 9, 2016-2018), will be studying the IGCSE syllabus B, completing their exams in 2024. The course focuses on 'International Relations since 1919'. It includes the following topics:

Grade 9

The Treaty of Versailles
 The League of Nations
 Germany 1919-1945
 Why had international peace collapsed by 1939?

Grade 10

The Origins of the Cold War
 How successful was the USA containment of communism
 The USSR, 1948-c.1989
 Paper 2 -source based paper

Students taking the examination in 2024 will follow an in-depth, source-oriented Paper 2 course on the policy of Containment.

Resources

Besides a variety of basic textbooks, such as *European and World History 1815 to 1919* (Hulton), *An Illustrated History of Modern Europe* (Longman), *Modern World History* (Walsh), this course is marked by the emphasis placed on primary documents taken from actual historical archives. In addition to familiarising students with a wide range of primary textual sources, be they newspapers, diplomatic correspondence, personal diaries and high literature, they are also presented with a vast array of visual and sonic documents, be it lithographs, photographs, painted portraits, modern cartoons; classical opera or the popular songs of the day, as well as by the watching of archive newsreels, government propaganda, historical documentaries and historical 'Hollywood' films. All of these are compounded by visits, actual or virtual, to museums, galleries and specific historical sites.

Assessment

In the first year, students are assessed according to their individual natures and needs. More generally, this is done by an on-going combination of indirect pastoral observation, actual class work, lively classroom discussions, and a variety of multimedia classroom presentations. Formative assessments are used in order to ensure a cumulative assimilation of some of the basic, foundational, factual information. These take the form of (a) regular classroom tests, (b) regular homework and holiday assignments; and (c) end of year individual and group multimedia projects. Formal summative assessment is increased in the second year in order to prepare the students for the final examinations.

Use of ICT

The students will use and develop IT skills in terms of word processing, creating animated powerpoint presentations, sound and video editing, google docs, tweeting, and blogging.

Geography Grades 9-10

Nature of the Subject

Geography helps the student to study the environment, recognizing that, whilst natural forces shape the Earth, humans are important agents of change in their environment and the action taken by one society may affect the entire world. This course is designed to lead students from an understanding of their immediate natural and social environment to an appreciation of spatial phenomena on local, regional, national and global scales. An important dimension of the geography programme is the fostering an awareness of the challenges to humankind, as well as of our individual and collective responsibilities.

The course also seeks to promote an awareness and appreciation of cultural differences, a respect for the values of others, a sense of responsibility toward our environment, and a genuine understanding of the international and inter-connected nature of individual and social development. In essence, Geography equals 'place' and the IGCSE requires students to use detailed place case study examples from around the world.

Aims and Objectives

The course aims to teach students to:

- collect, describe and analyse data.
- formulate and test hypotheses using their data and source material.
- develop their sense of curiosity, their imagination, and critical thinking skills.
- evaluate theories, concepts and arguments.
- consider a range of points of view and detect bias.
- make interdisciplinary connections.
- develop an understanding of the ways in which environments change through physical as well as human action.
- develop an understanding of how local changes may affect human lives globally.
- develop a concern for the quality of the environment, and an understanding of the need to plan and manage the present for future generations.
- appreciate the relevance of geography in analysing contemporary world issues,
- appreciate diversity and combat bias, prejudice and stereotyping
- develop detailed and varied revision notes and use different revision strategies

Course Content

Grade 9

1. Population
2. Settlement
3. Earthquakes and Volcanoes (Plate tectonics)
4. Rivers
5. Coasts

Grade 10

1. Development
2. Food production/Farming
3. Tourism
4. Energy
5. Environmental risks
6. Paper 2 - Geographical skills (map skills/data presentation and analysis skills)
7. Paper 4 - Alternative to coursework (instead of paper 3) - Fieldwork skills

Assessment

Students will be assessed on their knowledge and understanding and application of geographical concepts, and their ability to present, analyse and evaluate data. This is based on performance in homework, field work, case studies, end of unit tests and end of year exams. Approaches to learning skills such as motivation, interest, contribution to fieldwork and class discussions will also be assessed.

Use of past exam papers will be assessed using the official IGCSE grades A*-G.

Resources

Details of all topics are on Managebac.

The course is also supported by the following text book:

The New Wider World (Third edition)– David Waugh

Philip's World Atlas (used in class where appropriate).

Key revision websites - www.geographypods.com (IGCSE tab), <https://www.geo41.com> (pre-IB tab), <https://www.thegeographeronline.net> (IGCSE tab), www.s-cool.co.uk (revision), BBC bitesize geography (revision) amongst others.

Business Studies Grades 9-10

Nature of the subject

The IGCSE Business Studies course helps students to develop an understanding of business concepts and techniques across a range of different types of businesses. The course helps students to be able to:

- understand different forms of business organisations, the environments in which businesses operate and business functions such as marketing, operations and finance
- appreciate the role of people in business success.

They will also gain lifelong skills, including:

- the ability to calculate and interpret business data
- communication skills needed to support arguments with reasons
- the ability to analyse business situations and reach decisions or judgements

Aims and objectives

The main aims of the IGCSE Business Studies course are to enable students to:

- make effective use of relevant terminology, concepts and methods, and recognise the strengths and limitations of the ideas used in business
- apply their knowledge and critical understanding to current issues and problems in a wide range of business contexts
- distinguish between facts and opinions, and evaluate qualitative and quantitative data in order to help build arguments and make informed judgements
- appreciate the perspectives of a range of stakeholders in relation to the business environment, individuals, society, government and enterprise
- develop knowledge and understanding of the major groups and organisations within and outside business, and consider ways in which they are able to influence objectives, decisions and activities
- develop knowledge and understanding of how the main types of businesses are organised, financed and operated, and how their relations with other organisations, consumers, employees, owners and society are regulated
- develop skills of numeracy, literacy, enquiry, selection and use of relevant sources of information, presentation and interpretation
- develop an awareness of the nature and significance of innovation and change within the context of business activities.

Main content or themes

The IGCSE Business Studies course consists of 6 sections. Three sections are covered in Grade 9 and 3 in Grade 10.

Section covered in Grade 9	Topics
1. Understanding business activity	<ul style="list-style-type: none">• Business activity• Classification of businesses• Enterprise, business growth and size• Types of business organisation• Business objectives and stakeholder objectives
2. People in business	<ul style="list-style-type: none">• Motivating workers• Organisation and management• Recruitment, selection and training of workers• Internal and external communication
3. Marketing	<ul style="list-style-type: none">• Marketing, competition and the customer• Market research• Marketing mix• Marketing strategy
Sections covered in Grade 10	Topics
4. Operations management	<ul style="list-style-type: none">• Production of goods and services• Costs, scale of production and break-even analysis• Achieving quality production• Location decisions
5. Financial information and decisions	<ul style="list-style-type: none">• Business finance: needs and sources• Cash-flow forecasting and working capital• Income statements• Balance sheets• Analysis of accounts
6. External influences on business activity	<ul style="list-style-type: none">• Government economic objectives and policies• Environmental and ethical issues• Business and the international economy

Assessment

Throughout the 2 year course, the students will be assessed using a variety of in-class and homework assignments. This will include past examination questions in order to help develop familiarity and confidence in answering these style of questions.

The final external examination consists of 2 papers, each 1h30m long and worth 50% of the final grade.

Paper 1 - Written examination of 4 questions requiring a mixture of short answers and structured data responses. The students answer all the questions and there are 80 marks available in total.

Paper 2 - This is a written examination consisting of 4 questions based on a case study provided. The students answer all the questions and there are 80 marks available in total.

IGCSE Coordinated Sciences Grades 9-10

Nature of the Subject

Students follow a Co-ordinated Science course in Biology, Chemistry and Physics, which acts both as an introduction to more advanced work at IB DP level and as self-contained units for those who will not wish to study the sciences further. The course stresses the interrelationships between the main areas of science while allowing the separate disciplines to maintain their own identity.

As these are experimental sciences, practical and group work play a key role in the delivery of the subject content, and the importance of the practical skills of planning investigations, using and handling apparatus, observing, measuring and recording data are emphasised. The teaching methods reflect the developing nature of the subject: for example the increasing interest in environmental issues and the increased use of information technology. Health and environmental issues raised in science will complement similar discussions in the humanities and other areas.

Aims and Objectives

- ***to provide an enjoyable and worthwhile educational experience*** for all learners, whether or not they go on to study science beyond this level
- ***to enable learners to acquire sufficient knowledge and understanding to:***
 - become confident citizens in a technological world and develop an informed interest in scientific matters be suitably prepared for studies beyond Cambridge IGCSE
- ***to allow learners to recognise that science is evidence-based*** and understand the usefulness, and the limitations, of the scientific method
- ***to develop skills that:***
 - are relevant to the study and practice of science
 - are useful in everyday life
 - encourage a systematic approach to problem-solving
 - encourage efficient and safe practice
 - encourage effective communication through the language of science
- ***to develop attitudes relevant to science such as:***
 - concern for accuracy and precision
 - Objectivity
 - integrity
 - enquiry
 - initiative
 - inventiveness
- ***to enable learners to appreciate that:***
 - Science is subject to social, economic, technological, ethical and cultural influences and limitations
 - The applications of science may be both beneficial and detrimental to the individual, the community and the environment.

Course Content	
Grade 9	Grade 10
Biology	
B1 Characteristics of living organisms B2 Cells B3 Biological molecules B4 Enzymes B5 Plant nutrition B6 Animal nutrition B7 Transport B8 Gas exchange and respiration	B9 Coordination and response B10 Reproduction B11 Inheritance B12 Organisms and their environment B13 Human influences on ecosystems
Chemistry	
C1 The particulate nature of matter C2 Experimental techniques C3 Atoms, elements and compounds C4 Stoichiometry C5 Electricity and chemistry C6 Energy changes in chemical reactions C7 Chemical reactions C8 Acids, bases and salts	C9 The Periodic Table C10 Metals C11 Air and water C12 Sulfur C13 Carbonates C14 Organic chemistry
Physics	
P1 Motion P2 Work, energy and power P3 Thermal physics	P4 Properties of waves, including light and sound P5 Electricity and magnetism P6 Electric circuits P7 Electromagnetic effects P8 Atomic physics

Resources

The course is supported using the text 'Cambridge IGCSE Combined and Co-ordinated Coursebook', Mary Jones, Richard Harwood, Ian Lodge & David Sang (Cambridge University Press).

Assessment

The three assessment objectives in Co-ordinated Sciences are

AO1: Knowledge with understanding

AO2: Handling information and problem solving

AO3: Experimental skills and investigations

The course assessment is based on student performance in homework, practical work, end of unit tests, mid-year and end of year exams with a “*Working at IGCSE*” Grade. The *Approaches to Learning Grade* will reflect the student's general enthusiasm and interest for the subject, their attention to safety in experimental work, their ability to use ICT effectively, their self-motivation and their ability to work in a group and on individual assignments.

Final assessment is comprised of three papers:

Paper 2: Multiple choice (45 minutes)

Paper 4: Theory (2 hours)

Paper 6: Alternative to practical (90 minutes)

IGCSE Mathematics Grades 9-10

Nature of the Subject

The curriculum is based on the IGCSE (**International General Certificate of Secondary Education**) programme, which is administered by the University of Cambridge and recognised world-wide as a major educational qualification at the end of Grade 10 (course 0580). It also offers a sound base for the IB diploma programme.

The course is designed to take the previously learned general mathematical concepts and begin to apply them at a higher level of difficulty. It can be learned on either **core** or **extended** level. The content of the course below describes the **extended** level, the **core** one is reduced. Accordingly, at the end of the course the students pass different level examinations. Arithmetic, measurement and number theory will be included in all topics and are covered as separate subject material. Several mathematical concepts will be developed further including: statistics, geometry, algebra and probability.

Students are expected to learn and use a variety of problem solving strategies. Extended problems are given throughout the course. Statistics includes interpretation of graphs and calculation of mean, median mode and range.

In the end of the course students make extensive use of the graphing display calculator (GDC) as required under IB DP regulations to continue their education in the IB Diploma Programme. Students also make extensive use of the online e-copies of **Haese Mathematics** and **Oxford** textbooks, some special online software such as **myimaths.com**.

Aims and Objectives

- develop mathematical knowledge and oral, written and practical skills in a way which encourages confidence and provides satisfaction and enjoyment;
- read mathematics, and write and talk about the subject in a variety of ways;
- develop a feel for number, carry out calculations and understand the significance of the results obtained;
- apply mathematics in everyday situations and develop an understanding of the part which mathematics plays in the world around us;
- solve problems, present the solutions clearly, check and interpret the results;
- develop an understanding of mathematical principles;
- recognise when and how a situation may be represented mathematically, identify and interpret relevant factors and, where necessary, select an appropriate mathematical method to solve the problem;
- use mathematics as a means of communication with emphasis on the use of clear expression;
- develop an ability to apply mathematics in other subjects, particularly science and technology;
- develop the abilities to reason logically, to classify, to generalise and to prove;
- appreciate patterns and relationships in mathematics;
- produce and appreciate imaginative and creative work arising from mathematical ideas;
- develop their mathematical abilities by considering problems and conducting individual and co-operative enquiry and experiment, including extended pieces of work of a practical and investigative kind;
- appreciate the interdependence of different branches of mathematics;
- acquire a foundation appropriate to their further study of mathematics and of other disciplines.

Course Content

Grades 9-10 (34*2 weeks, 170*2 periods)

Grade 9 Core Book	Grade 9 Extended Book Low	Grade 9 Extended Book High
<p>Unit 1: Shape and Space 1</p> <ul style="list-style-type: none"> • Accurate Drawing • Angle facts • Angles in polygons and circles • Symmetry • Circle Calculations • Area • Volume • Scale Drawing 	<p>Unit 1: Numbers</p> <ul style="list-style-type: none"> • Arithmetic • Number facts and Sequences • Approximation and estimation • Standard Form • Ratio and Proportions • Percentages • Speed, Distance and Time 	<p>Unit 1: Numbers</p> <ul style="list-style-type: none"> • Arithmetic • Number facts and Sequences • Approximation and estimation • Standard Form • Ratio and Proportions • Percentages • Speed, Distance and Time
<p>Unit 2 Algebra 1</p> <ul style="list-style-type: none"> • Sequences • Solving Equations • Drawing Graphs • Gradient $y=mx+b$ 	<p>Unit 2: Algebra 1</p> <ul style="list-style-type: none"> • Negative numbers • Directed numbers • Formulae • Brackets and simplifying • Linear equations • Problem solving by equations • Simultaneous equations • Problem solving by Simultaneous equations • Factorising • Quadratic equations • Problems solved by quadratic equations • Non-linear simultaneous equations 	<p>Unit 2: Algebra 1</p> <ul style="list-style-type: none"> • Negative numbers • Directed numbers • Formulae • Brackets and simplifying • Linear equations • Problem solving by equations • Simultaneous equations • Problem solving by Simultaneous equations • Factorising • Quadratic equations • Problems solved by quadratic equations • Non-linear simultaneous equations

Unit 3 Number 1: <ul style="list-style-type: none"> Place Value Arithmetic without a calculator Inverse Operations Decimals Flow Diagrams Properties of numbers Inequalities Time Long multiplication and division Percentages Map scales and ratio Proportion Speed, distance and time Approximations Metric Units Problems 1 	Unit 3 Mensuration: <ul style="list-style-type: none"> Area The circle Arc length and Sector Area Chord of a Circle Volume Surface Area 	Unit 3 Mensuration: <ul style="list-style-type: none"> Area The circle Arc length and Sector Area Chord of a Circle Volume Surface Area
Unit 4 Handling Data 1: <ul style="list-style-type: none"> Displaying Data Questionnaires Averages Frequency polygon 	Unit 4 Geometry: <ul style="list-style-type: none"> Fundamental Results Pythagoras Theorem Symmetry Similarity Circle Theorems Constructions and Loci Nets 	Unit 4 Geometry: <ul style="list-style-type: none"> Fundamental Results Pythagoras Theorem Symmetry Similarity Circle Theorems Constructions and Loci Nets
Unit 5 Shape and Space 2: <ul style="list-style-type: none"> Transforming shapes Quadrilaterals and other polygons Bearings Locus Pythagoras Theorem Problems 2 	Unit 5: Algebra 2 <ul style="list-style-type: none"> Algebraic fractions Changing the subject of a formula Variation 	Unit 5: Algebra 2 <ul style="list-style-type: none"> Algebraic fractions Changing the subject of a formula Variation Indices Inequalities Linear programming
		Unit 6: Trigonometry <ul style="list-style-type: none"> Right-angled triangles Scale drawing Three dimensional problems Sine, cosine and tangent of any angle The sine rule The cosine rule

Grade 10 Core Book (Grade 9 Core book as well)	Grade 10 Core Book(In case students who took extended in Grade 9 wants to go back to core)	Grade 10 Extended
Unit 6 Algebra 2: <ul style="list-style-type: none"> Finding a rule Simultaneous equations Interpreting graphs Brackets and factors Changing the subject of a formula 	Unit 2 Algebra: <ul style="list-style-type: none"> 2.3 Drawing graphs 2.4 Gradient $y=mx+b$ 	Unit 7: Graphs <ul style="list-style-type: none"> Drawing accurate graphs Gradients Equation of a straight line $y=mx+c$ Plotting curves Interpreting graphs Graphical solution of equations Distance-time graphs Speed-time graphs Differentiation
Unit 7 Number 2: <ul style="list-style-type: none"> Percentages change Fractions, Ratio, decimals and percentages Estimating Errors in measurement Mental Arithmetic 	Unit 3 Numbers: <ul style="list-style-type: none"> 3.3 Inverse Operations 3.7 Inequalities 	Unit 8: Sets, vectors, Functions and transformations <ul style="list-style-type: none"> Sets Logical problems Vectors Column Vectors Vector geometry Functions Simple transformations Combined transformations
Unit 8 Probability: <ul style="list-style-type: none"> Probability of an event Exclusive Events Relative Frequency 	Unit 4 Handling Data 1: <ul style="list-style-type: none"> 4.1 Displaying Data 4.2 Questionnaires 4.3 Averages 4.4 Frequency Polygons 	Unit 9: Statistics <ul style="list-style-type: none"> Data display Mean, Median and Mode Scatter Graphs Box-and-whisker plots Cumulative frequency Comparing data sets
Unit 9 Shape and Space 3: <ul style="list-style-type: none"> Similar shapes Trigonometry in right angles triangles 	Unit 5 Shape and Space 2: <ul style="list-style-type: none"> 5.1 Transforming shapes 5.2 Quadrilaterals and other polygons 5.3 Bearings 5.4 Locus 	Unit 10: Probability <ul style="list-style-type: none"> Simple Probability Relative frequency Exclusive and independent events Tree diagrams Probability of venn diagrams Conditional probability

Unit 10 Number 3: <ul style="list-style-type: none"> • Powers and roots • Standard form • Fractions • Negative Numbers • Substituting into formulae 	Unit 6 Algebra 2: <ul style="list-style-type: none"> 6.1 Finding a rule 6.2 Simultaneous equations 6.3 Interpreting Graphs 6.4 Brackets and factors 	
	Unit 8 Probability: <ul style="list-style-type: none"> • 8.1 Probability on an event • 8.2 Exclusive events • 8.3 Relative frequency • 	
	Unit 9 Shapes and Space 3: <ul style="list-style-type: none"> • 9.1 Similar shapes • 9.2 Trigonometry in right angled triangles 	
	Unit 10 Number 3: <ul style="list-style-type: none"> • 10.1 Power and Roots • 10.2 Standard Form • 10.3 Fractions • 10.4 Negative Numbers • 10.5 Substituting into formulae 	

Unit 1: Number

Sets and Venn Diagrams. Number Sets: natural numbers, integers, rational numbers, irrational numbers, real numbers. Fractions and decimals. Directed numbers. Representation of the number sets with Venn diagrams. Real numbers as points on the number line. Interval and set notation. Union and intersection of the sets. Problem solving with Venn diagrams.

Indices. Natural, negative, zero and fractional indices.

Financial Mathematics. Currency conversion. Simple and compound interest financial schemes.

Variation. Direct and inverse proportionality.

Unit 2: Algebra and graphs

Algebraic Expansion and Factorisation. Expansion laws. Factorisation. Further expansion. The binomial expansion. Factoring expressions with four terms. Factorising quadratic trinomials. Factorisation by splitting. Miscellaneous factorisation.

Quadratic equations. Quadratic equations of the form. Solution by factorisation. Completing the square. The quadratic formula. Problem solving.

Algebraic fractions. Simplifying algebraic fractions. Multiplying and dividing algebraic fractions. Adding and subtracting algebraic fractions. More complicated fractions, their transformations.

Formulae. Formula substitution. Formula rearrangement. Formula construction.

Relations, functions and sequences. Relations and functions. Functions. Function notation. Composite functions. Inverse functions. Transforming the graphs. The modulus function. Where functions meet - algebraically and geometrically. Number sequences. Recognising patterns and developing general terms of numerical sequences.

Quadratic functions. Quadratic functions. Graphs of quadratic functions. Axes intercepts. Axis of symmetry and vertex. Quadratic optimization.

Exponential functions. Index laws. Exponential functions. Growth and decay (depreciation). Exponential equations.

Inequalities. Sign diagrams. Solving inequalities with one variable, showing them on the number line, representing in the interval and the set notations. Two variable inequalities on the set of axes. Linear programming.

Basics in Differential Calculus. The tangent, the gradient (slope) of the graph. Differentiation of polynomials. Stationary points, turning points. Second derivative. Discriminate between maxima and minima. Application to kinematics

Unit 3: Geometry

Pythagoras' theorem. Pythagoras' theorem. The converse of Pythagoras' theorem. Problem solving using Pythagoras' theorem. Three-dimensional problems.

Congruence and similarity. Congruence of figures. Constructing triangles. Congruent triangles. Similarity. Areas and volumes of similar figures.

Deductive geometry. Circle theorems. Further circle theorems. Cyclic quadrilaterals. Direct and indirect proof of geometrical theorems

Unit 4: Mensuration

Units of mass, length, area, volume and capacity. Perimeter and area of a rectangle, triangle, parallelogram and trapezium and compound shapes derived from these. The circumference and area of a circle. The surface area and the volume of a cuboid, a prism, a cylinder, a sphere and a cone. The areas and volumes of compound shapes.

Unit 5: Coordinate geometry

Coordinate geometry. Distance between two points. Midpoints. Gradient (or slope). Gradients of parallel and perpendicular lines. Using coordinate geometry. Equations of straight lines. Equations of a perpendicular bisector. Distance from a point to a line. 3-dimensional coordinate geometry.

Unit 6: Trigonometry

Trigonometry. Trigonometric ratios sine, cosine, tangent. Geometrical problems solving with trigonometry. 3-dimensional problem solving. The unit circle. Area of a triangle using sine. The

sine rule. The cosine rule. Problem solving with the sine and cosine rules. Basic trigonometric identity.

Trigonometric functions of the angle of any magnitude from the unit circle. The multiples of 30° , 45° and 60° . Graphing trigonometric functions. Modelling with sine functions. Simple trigonometric equations with the unit circle and with the graphs.

Unit 7: Transformations

Vectors. Directed line segment representation. Vector equality. Vector addition. Vector subtraction. Multiplication by a scalar. Vectors in component form. Problem solving with vectors.

Transformations. Rotations, Enlargements (with positive and negative scale factors), Translations and Reflections.

Unit 8: Probability

Probability. Experimental probability. Probabilities from tabled data. Representing combined events. Theoretical probability. Compound events. Using tree diagrams. Venn diagrams. Sampling with and without replacement. Mutually exclusive and non-mutually exclusive events. Independent events and not independent events. Conditional probability.

Unit 9: Statistics

Univariate data analysis. Statistical terminology. Quantitative (numerical) data. Grouped discrete data. Continuous data. Measuring the centre (mean, mode, median). Cumulative frequency. Measuring the spread. Box-and-whisker plots. IQR

Bivariate analysis. Positive, negative and zero correlation with reference to a scatter diagram. Draw a straight line of best fit by eye.

Resources

- *Mathematics for the international student. MYP 4. Second Edition (Haese Mathematics)*
- *Mathematics for the international student. MYP 5 Plus. Second Edition (Haese Mathematics)*
- *Complete Mathematics for Cambridge iGCSE - Core (Oxford University Press), David Rayner*
- *Complete Mathematics for Cambridge iGCSE - Extended (Oxford University Press), David Rayner*

Web Resources

Online website : www.myimaths.com

Channels:

MathAntics <http://www.mathantics.com/>

MyWhyU [MyWhyU](https://www.youtube.com/channel/UCq0EGvLTyy-LLT1oUSO_0FQ)

Eddi Woo https://www.youtube.com/channel/UCq0EGvLTyy-LLT1oUSO_0FQ

Eureka!

https://www.youtube.com/watch?v=HRq-v4Gmzxg&list=PL_pjxFpIQgU1Om7QA9IF_K1rjOWkr2k3m

Dr Math <http://mathforum.org/dr.math/>

Khan Academy <http://www.khanacademy.org/>

Math is Power <http://mathispower4u.yolasite.com/>

Exam Solutions <http://www.examsolutions.net/maths-revision/index.php>

Patrick JMT <http://patrickjmt.com/>

Marcus du Sautoy on BBC – any available video

Occasional related videos from different sites

Assessment

The course assessment is based on student performance in homework, quizzes, end of unit tests, projects and end of year exams (different for the **core** and the **extended** levels). The Approaches to Learning grade will reflect the student's general enthusiasm and interest for the subject, their self motivation and ability to work individually and in a group, and their perseverance in solving problems. The Subject Skills grade will reflect the student's level of knowledge and understanding, their application and reasoning, their ability to communicate ideas and solutions clearly and precisely, and their mathematical insight. Overall assessment reflects students' following the IB Learner Profile principles.

IGCSE Art and Design Grades 9-10

Nature of the Subject

The Art program encourages personal expression, imagination, sensitivity, conceptual thinking, powers of observation, analytical ability and practical attitudes. Learners will have opportunities to gain a greater understanding of the role of the visual arts in the history of civilisations, and so widen and enrich their cultural horizons.

The syllabus helps equip learners with lifelong skills including; working with confidence and enthusiasm as they develop technical skills in two- and/or three-dimensional form and composition; developing the ability to identify and solve problems in visual and tactile form, as well as the ability to develop ideas from initial attempts to outcomes.

Aims and Objectives

The art program encourages learners to develop skills such as:

- record from direct observation and personal experience
- identify and solve problems in visual and/or other forms
- develop creativity, visual awareness, critical and cultural understanding
- generate an imaginative, creative and personal response
- gain confidence, enthusiasm and a sense of achievement in the practice of art and design
- grow independence in the refinement and development of ideas and personal outcomes
- engage and experiment with a range of media, materials and techniques, including new media and technologies, where appropriate
- experience working in relevant frameworks and exploration of manipulative skills necessary to form, compose and communicate in two and/or three dimensions
- acquire knowledge of a working vocabulary relevant to the subject and an interest in, and a critical awareness of, other practitioners, environments and cultures
- investigate, analyse, experiment, interpret through the application of practical skills and theoretical knowledge

Content

Projects are designed in the form of units and later on as early as the second semester in Grade 9, as coursework. Students aim at developing a personal way of approaching and understanding Art from both a personal and theoretical point of view. Students are encouraged to develop their personal ideas from an understanding of the work of others and the world around them. Visits to galleries will be done with the class but are also encouraged outside of school hours.

The exam is divided into two components, coursework and an externally set assignment each worth 50% of the total grade. Each of these requires a portfolio of preparatory studies, accompanied by a final outcome. For the externally set assignment, the final outcome is produced during an 8 hour exam.

Assessment

Assessment is based on finished products, the students' individual artistic and aesthetic growth as well as attitude and effort. But is also given throughout the lesson, in a formative way, enabling students to reflect on their practice in progress and refine their work as it goes along.

In formal assessments, for each component, students are assessed on four objectives each is worth 25 marks.

- A01 Record
 - Record ideas, observations and insights relevant to intentions as work progresses
- A02 Explore
 - Explore and select appropriate resources, media, materials, techniques and processes
- A03 Develop
 - Develop ideas through investigation, demonstrating critical understanding
- A04 Present
 - Present a personal and coherent response that realises intentions and demonstrates an understanding of visual language

Physical Education Grades 9-10

Nature of the Subject

Physical Education aims to educate students within a holistic learning environment, allowing them to acquire the knowledge, concepts, skills and attitudes to enable them to become active, healthy, and happier citizens. In doing so, it aims to improve their physical, social, and emotional well being.

Aims and objectives

Physical Education in Grades 9-10 aims to ensure that students develop a clear understanding of the role physical activity plays in the development of a healthy and happy lifestyle. The P.E. programme is structured to ensure that students are given the opportunity to enjoy a varied, flexible and balanced programme. However, there is an increased emphasis on how the various activities lead to improved physical, intellectual, social and emotional development. It aims to develop students' technical skill and tactical awareness in a variety of activities ensuring that they are capable of participating confidently in a variety of physical activities throughout their lives.

Through participation in Grade 9-10 P.E. all students should develop the ability to:

- Demonstrate the basic skills associated with a wide range of physical activities.
- Participate effectively in a wide range of games and physical activities.
- Understand the basic rules in a wide range of games and physical activities.
- Acquire positive values and attitudes for the development of an active, healthy lifestyle.
- Acquire an appreciation of athletic potential and athletic achievement.
- Maintain good health and achieve a higher level of physical fitness.
- Develop desirable social traits such as friendliness, cooperation, respect for others, honesty and good sportsmanship.
- Develop desirable emotional traits such as courage, determination, commitment, self confidence and resilience.

Main content or themes

Invasion Games - Basketball / Football / Tag Rugby / Ultimate Frisbee / Scratch Ball / Handball /

Australian Rules Football / Field Hockey / Lacrosse

Net Games - Tennis / Badminton / Volleyball / Speedminton

Striking Games - Rounders / Baseball / Kwik Cricket

Athletics - Sprints & Middle Distance / Relays / Discus / Shot Put / Long Jump / High Jump

Fitness Testing - Components of Fitness / Designing exercise programs

Assessment

Students receive constant guidance and feedback during all lessons. All lessons begin with a low intensity skill development and warm up phase providing students with the opportunity to develop their skills and refine their technique. Students receive immediate feedback following fitness tests and are given guidance on how to improve their fitness levels.

Overview of the IB Diploma Programme

Overview of the IB Diploma Programme



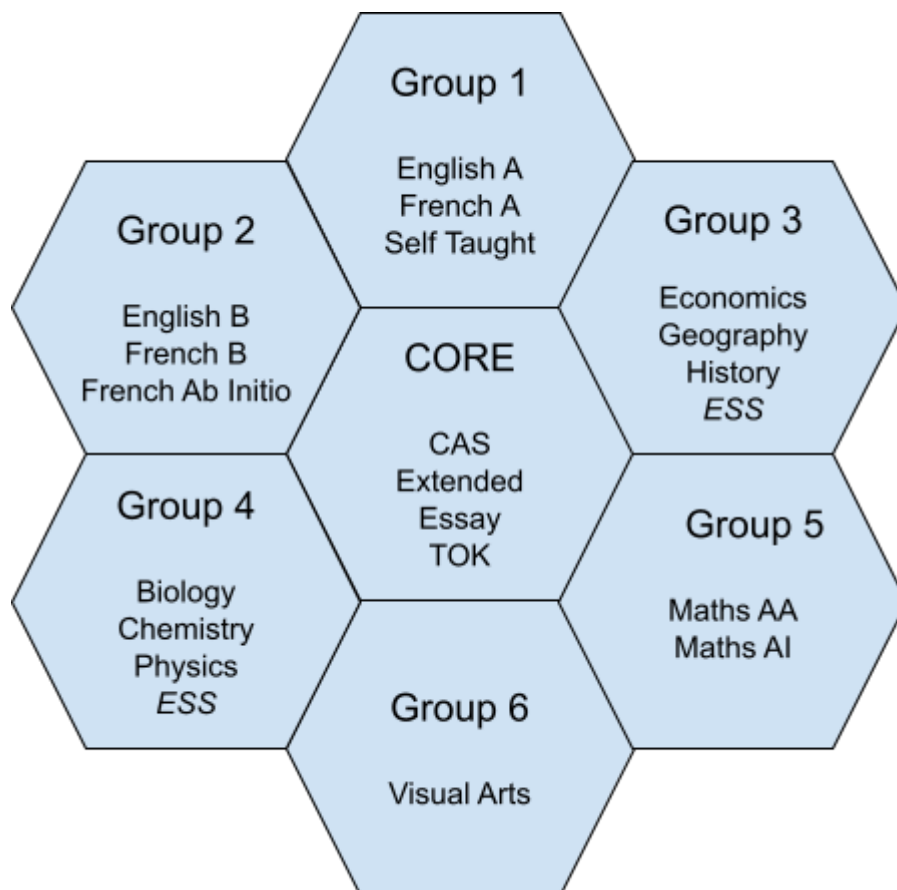
Grade 11 & 12 students follow the International Baccalaureate Diploma Programme (IBDP). The IBDP is a comprehensive and rigorous curriculum aimed at students aged 16-19 years, leading to a qualification that is recognised by universities around the world for entrance onto undergraduate programmes. It is a broad-based two-year course that aims to encourage students to be knowledgeable and inquiring, but also caring and compassionate. There is a strong emphasis on encouraging students to develop intercultural understanding, open-mindedness, and the attitudes necessary for them to respect and evaluate a range of points of view.

The course is presented as six academic areas enclosing a central core. Students study two modern languages, a social science, an experimental science,

mathematics and one of the creative arts. Instead of an arts subject, students can choose two subjects from another area. The central core consists of three elements, the extended essay, theory of knowledge and creativity, activity, service, and these are both compulsory and central to the philosophy of the programme.

Normally, three subjects (and not more than four) are taken at higher level (HL), and the others are taken at standard level (SL). Subjects at HL are studied in greater depth and breadth than at SL.

At ISL, students currently study:



Grades 11-12

IB Curricula

IB English Language A: Literature

Nature of the Subject

The study of English literature is concerned with our conceptions, interpretations and experiences of the world. Studying literature can be an exciting, disturbing yet ultimately comforting experience; it provides tremendous opportunities for independent, original, critical and clear thinking.

Aims and Objectives

The aims of the Language A: Literature programme at both the Higher and Standard Levels are to:

- introduce students to a range of texts from different periods, styles, genres and text types.
- develop in students the ability to engage in close, detailed analysis of individual texts and make relevant connections between historical context, global context and texts.
- develop power of expression, both in oral and written communication, whilst developing their knowledge of global issues.
- encourage students to recognize the importance of the contexts in which texts are written and received and appreciate the different perspectives and how these perspectives construct meaning.
- encourage students to appreciate the formal, stylistic and aesthetic qualities of texts.
- promote in students an enjoyment of, and lifelong interest in, literature and the impact it has.
- develop in students an understanding of the techniques involved in literary criticism and encourage them to form independent literary judgments.
- Prepare students for academic writing in higher education.

Course Content

The curriculum offers students a wide range of fiction, from a variety of genres, eras, backgrounds, and themes. They are all designed to support future academic study by developing high levels of language competence and communication skills, as well as social, aesthetic and cultural literacy. Students study 10 works at SL and 13 works at HL. Formal literary analysis and Essay writing are taught throughout the course as are oral commentaries.

Assessment

Both external and internal assessment is used in the Diploma Programme. IB examiners mark work produced for external assessment, while work produced for internal assessment is marked by teachers and externally moderated by the IB. Students are assessed orally through presentations and commentary, their written work in the form of two exams (one seen and one unseen) and a written assignment if they are higher level. Students' work will be assessed formatively in class and feedback will support curricular goals and encourage appropriate student learning.

IB English Language A: Language and Literature

Nature of the subject

This course is designed for students who can conduct their studies in fully fluent, native-level English, both orally and in written form. The study of texts, both literary and non-literary, provides a focus for developing an understanding of how language works to create meanings in a culture, as well as in particular texts. The course is available at two levels: Higher Level (HL) and Standard Level (SL).

Aims and objectives

- Introduce students to a range of texts from different periods, styles and genres
- Develop in students the ability to engage in close, detailed analysis of individual texts and make relevant connections
- Develop the methodological tools for writing essays and commentaries
- Develop the student's' approaches to expression, both in oral and written communication
- Encourage students to recognise the importance of context
- Encourage, through the study of texts, an appreciation of the different perspectives of people from other cultures, and how these perspectives construct meaning
- Encourage students to appreciate the formal, stylistic, and aesthetic qualities of texts
- Promote in students an enjoyment of, and lifelong interest in, language and literature
- Develop in students an understanding of how language, culture and context determine the ways in which meaning is constructed in texts
- Encourage students to think critically about the different interactions between text, audience and purpose

Main content or themes

The course is built around three main themes: Time and Space, Intertextuality, and Readers, Texts, Writers.

Additionally, the following 7 concepts guide students to develop analytical and critical thinking skills: Identity, culture, creativity, communication, perspective, transformation, and representation.

The curriculum offers students a wide range of fiction, from a variety of genres, eras, backgrounds, and themes. They are all designed to support future academic study by developing high levels of language competence, and communication skills, as well as social, aesthetic, and cultural literacy. Students study a minimum of four literary works at SL and six at HL, as well as an unlimited number of non-literary texts from a great variety of text types (including, but not limited to: infographics, articles, advertisements, etc).

Formal literary analysis and essay writing are taught throughout the course, as are oral commentaries.

Assessment

Both external and internal assessment is used in the Diploma Programme. IB examiners mark work produced for external assessment, while internal assessments are evaluated by teachers and externally moderated by the IB.

- Internal: Students are assessed orally through **an individual oral exam** where they comment on a literary and a non-literary text of their choice, picked from material studied in class.
- External:
 - Paper 1:** commentary of one (SL) or two (HL) non-literary text
 - Paper 2:** comparative essay about literary texts studied in class
 - HL Essay:** a 1200 to 1500 words essay on a literary topic

IB English B

Nature of the Subject

English B focuses on language acquisition and the “receptive, productive and interactive” skills in listening, speaking, reading and writing. In addition, the course emphasises intercultural understanding. At ISL, English B is offered at Higher level. The syllabus includes a range of authentic materials, including newspapers, magazines, radio, film and literature. Students not only focus on grammatical structures and enrich their vocabulary but put this knowledge into practice in their written and oral work.

Aims and Objectives

The English B course aims to:

- develop international-mindedness through the study of languages, cultures and ideas and issues of global significance
- enable students to communicate in English in a range of contexts and for a variety of purposes
- encourage, through the study of texts and through social interaction, an awareness and appreciation of a variety of perspectives of people from diverse cultures
- develop students’ understanding of the relationship between the languages and cultures with which they are familiar
- develop students’ awareness of the importance of language in relation to other areas of knowledge
- provide students, through language learning and the process of inquiry, with opportunities for intellectual engagement and the development of critical- and creative-thinking skills
- provide students with a basis for further study, work and leisure through the use of an additional language
- foster curiosity, creativity and a lifelong enjoyment of language learning

Assessment

The IB defines five assessment objectives for Language B:

1. Communicate clearly and effectively in a range of contexts and for a variety of purposes.
2. Understand and use language appropriate to a range of interpersonal and/or intercultural contexts and audiences.
3. Understand and use language to express and respond to a range of ideas with accuracy and fluency.
4. Identify, organise and present ideas on a range of topics.
5. Understand, analyse and reflect upon a range of written, audio, visual and audio-visual texts.

External assessment

Paper 1 (1 hour 30 minutes) Productive skills— (30 marks)- One writing task of 450–600 words

Paper 2 (2 hours) Receptive skills— (65 marks)- Listening comprehension (1 hour) (25 marks)+ Reading comprehension (1 hour) (40 marks)

Internal assessment

Individual oral assessment A conversation with the teacher, based on an extract from one of the literary works studied in class, followed by a discussion based on one or more of the themes from the

syllabus. (30 marks)

IB FRENCH A: Language and Literature

Nature of the subject

This course is designed for students who have experience of using French as a native speaker orally but also in written form. The study of texts, both literary and non-literary, provides a focus for developing an understanding of how language works to create meanings in a culture, as well as in particular texts. Two levels: Higher level: HL and standard level: SL.

Aims and objectives

- Introduce students to a range of texts from different periods, styles and genres
- Develop in students the ability to engage in close, detailed analysis of individual texts and make relevant connections
- Develop the methodological tools for writing essays and commentaries
- Develop the student's powers of expression, both in oral and written communication
- Encourage students to recognize the importance of the contexts
- Encourage, through the study of texts, an appreciation of the different perspectives of people from other cultures, and how these perspectives construct meaning
- Encourage students to appreciate the formal, stylistic and aesthetic qualities of texts
- Promote in students an enjoyment of, and lifelong interest in, language and literature
- Develop in students an understanding of how language, culture and context determine the ways in which meaning is constructed in texts
- Encourage students to think critically about the different interactions between text, audience and purpose

Main content or themes

The course is built around three main themes:

Time and space: context study

Intertextuality: links between texts

Readers, texts, writers: effects on readers, messages and aims of authors

7 concepts are also helping students to develop analytical and critical thinking skills: Identity, culture, creativity, communication, perspective, transformation and representation.

The curriculum offers students a wide range of fiction, from a variety of genres, eras, backgrounds, and themes. They are all designed to support future academic study by developing high levels of language competence and communication skills, as well as social, aesthetic and cultural literacy. Students study 4 works at SL and 6 works at HL and a non-limited number of non-literary texts from a great variety of text types (with or without pictures).

Formal literary analysis and Essay writing are taught throughout the course as are oral commentaries.

Assessment

Both external and internal assessment is used in the Diploma Programme. IB examiners mark work produced for external assessment, while internal assessments are evaluated by teachers and externally moderated by the IB.

Internal: Students are assessed orally through **an individual oral exam** where they have to comment on a literary and a non-literary text of their choice picked from material studied in class.

External: **paper 1**: commentary of one (SL) or two (HL) non-literary texts
paper 2: comparative essay about literary texts studied in class
written task: a 1200 to 1500 words essay on a literary topic

FRENCH B

Nature of the Subject

French B focuses on language acquisition and the “receptive, productive and interactive” skills in listening, speaking, reading and writing. In addition, the course places an emphasis on intercultural understanding and conceptual understandings of how language works. French B is offered at both Higher and Standard levels. The syllabus includes a wide range of authentic materials, including newspapers, magazines, radio, podcasts, videos, television, film and literature. Students not only focus on grammatical structures and enrich their vocabulary but put this knowledge into practice in their written and oral work.

Aims and Objectives

The French B course aims to:

- develop international-mindedness through the study of languages, cultures, and ideas and issues of global significance.
- enable students to communicate in French in a range of contexts and for a variety of purposes
- encourage, through the study of texts and through social interaction, an awareness and appreciation of a variety of perspectives of people from diverse cultures
- develop students’ understanding of the relationship between the languages and cultures with which they are familiar
- develop students’ awareness of the importance of language in relation to other areas of knowledge
- provide students, through language learning and the process of inquiry, with opportunities for intellectual engagement and the development of critical- and creative-thinking skills
- provide students with the basis for further study, work and leisure through the use of an additional language as well as foster curiosity, creativity and a lifelong enjoyment of language learning

Assessment

Standard level

External assessment (3 hours)

Paper 1 (1 hour 15 minutes) Productive skills (30 marks)- One writing task of 250–400 words)

Paper 2 (1 hour 45 minutes) Receptive skills (65 marks) - Listening comprehension (45 minutes) (25 marks) + Reading comprehension (1 hour) (40 marks)

Internal assessment

Individual oral assessment A conversation with the teacher, based on a visual stimulus, followed by a discussion based on an additional theme. (30 marks)

Higher level

External assessment (3 hours 30 minutes)

Paper 1 (1 hour 30 minutes) Productive skills— (30 marks)- One writing task of 450–600 words

Paper 2 (2 hours) Receptive skills— (65 marks)- Listening comprehension (1 hour) (25 marks)+ Reading comprehension (1 hour) (40 marks)

Internal assessment

Individual oral assessment A conversation with the teacher, based on an extract from one of the literary works studied in class, followed by a discussion based on one or more of the themes from the syllabus. (30 marks)

FRENCH AB INITIO Grade 11&12

Nature of the subject

Language ab initio is a language acquisition course designed to provide students with the necessary skills and intercultural understanding to enable them to communicate successfully in an environment where the language studied is spoken. This process encourages the learner to go beyond the confines of the classroom, expanding an awareness of the world and fostering respect for cultural diversity.

Aims and objectives:

- To develop students' cultural understanding.
- To enable students to understand and use the language they have studied in a range of contexts and for a variety of purposes.
- To encourage through the study of texts and through social interaction, an awareness and appreciation of the different perspectives of people from other cultures.
- To develop students' awareness of the relationship between the languages and cultures with which they are familiar.
- To provide students with a basis for further study, work and leisure through the use of an additional language.

Language acquisition will be achieved through the development of **receptive**, **productive** and **interactive** skills and competencies.

These skills will be developed through a maximal exposure to a variety of authentic texts and documents.

Main content or themes

The language ab initio course is organised into three themes.

Individual and society	Leisure and work	Urban and rural environment
Daily routines	Employment	Environmental concerns
Education	Entertainment	Global issues
Food and drink	Holidays	Neighbourhood
Personal details, appearance and character	Media	Physical geography
Physical health	Sport	Town and services
Relationships	Technology	Weather
Shopping	Transport	

Assessment

- **External assessment**
 - o **Paper 1** : Receptive skills
 - o **Paper 2** : Productive skills
 - o **Written assignment** : Receptive and productive skills. A piece of writing, 200 – 350 words, demonstrating intercultural understanding and written in the target language.
- **Internal assessment**
 - o **Individual oral**. Three-part oral internally assessed by the teacher and externally moderated by the IB towards the end of the course.

Nature of the Subject

History is more than the study of the past, it is an encounter with the present, the past and the future, which can be as creative as it can be scientific. It is the process of imagining, recording, reconstructing and interpreting the past in the present through the investigation of the traces and memories of the past through a variety of sources. It is a discipline that gives people an understanding of themselves and others in relation to the world, both past and present, and helps them imagine a future.

Students of history learn how it is an exploratory subject that poses questions, sometimes without providing definitive answers. In order to understand the past, students must engage with it both through exposure to primary historical sources and through the work of historians. Historical study involves both selection and interpretation of data and critical evaluation of it. Students of history should appreciate the relative nature of historical knowledge and understanding, as each generation reflects its own world and preoccupations and as more evidence emerges. A study of history both requires and develops an individual's understanding of, and empathy for, people living in other periods and contexts.

Diploma Programme history consists of a standard level (SL) and higher level (HL) core syllabus comprising an in-depth study of an individual prescribed subject and the selection of two topics. Students and teachers have a choice of route 1 that explores the main developments in the history of Europe and the Islamic world (from 500 to 1570) or route 2 that encompasses the main developments in 20th century world history. At HL students select from a range of options that cover a wider time span encouraging in-depth study.

Thus Diploma Programme history provides both structure and flexibility, fostering an understanding of major historical events in a global context. It requires students to make comparisons between similar and dissimilar solutions to common human situations, whether they be political, economic or social. It invites comparisons between, but not judgments of, different cultures, political systems and national traditions.

The content of the history course is intrinsically interesting and it is hoped that many students who follow it will become fascinated with the discipline, developing a lasting interest in it, whether or not they continue to study it formally.

The international perspective in Diploma Programme history provides a sound platform for the promotion of international understanding and, inherently, the inter-cultural awareness necessary to prepare students for global citizenship. Above all, it helps to foster respect and understanding of people and events in a variety of cultures throughout the world.

Aims and Objectives

The course is designed to promote international awareness and an understanding of people living in a variety of places at different times, as well as to develop an appreciation for history as an academic discipline. Having followed the course, students are expected to:

- comprehend, analyse, evaluate and integrate source material critically as historical evidence;
- demonstrate historical understanding of 20th century world history through the acquisition, selection, effective use and synthesis of knowledge;
- explain different approaches to, and interpretations of, historical events and topics;

- present arguments that are clear, coherent, relevant and well substantiated;
- integrate an international perspective in historical analysis and explanations;
- be able to plan, organise and present an individual historical investigation.

Course Content

At ISL, for IB History Paper 1, students will follow Route 3. The Route 3 Prescribed Subject is a documents-based course entitled 'Rights and Protests' in which students focus on two case studies:
Apartheid South Africa (1948-1964)
Civil Rights Movement USA (1954-1965)

For the IB Paper 2 World History Topic, students will follow Authoritarian and Single Party States and 'The Cold War: Superpower Tensions and Rivalries'. Particular attention is devoted to developing the skills of historical inquiry and analysis, including working with different types of sources in all Papers.

Higher Level students also cover a "Regional Option", focusing on 'Aspects of US foreign policy'. The American Civil War causes, processes and events is also studied. In addition, both standard and higher level history students will conduct an individual historical investigation at the end of IB year one on any subject in world history of their own choosing. Where possible, this material will be linked to the UNESCO Memory of the World Register

Resources

A Companion to World History (IBO/Oxford University Press); *History of Europe and the Middle East, Course Companion* (IBO/Oxford University Press)

The course also makes extensive use of films, documentaries and other visual materials. The students will use and develop IT skills in terms of word processing, creating animated powerpoint presentations, sound and video editing, using edmodo, google docs, dropbox, tweeting, and blogging.

Assessment

Assessment is based on a variety of written and oral tasks, including essays, document analysis, the historical investigation and presentations. The final IB grade is based on the historical investigation and an external examination including both essays and source-based assignments.

IB Geography

Nature of the Subject

The aim of Geography is to foster an appreciation and informed concern for the world. The program is designed to develop a knowledge and understanding of people and places, and of how these interrelate and interconnect. The emphasis is on the human geography issues of population, resources and development. The optional blocks are separated into Human, Physical and Skill-Based themes, but they maintain the elements of human decision-making and management issues.

Development of skills such as map-reading, graphical interpretation and statistical analysis is conducted throughout the course. Opportunities are taken to make the study of Geography practical and personal, using field work to emphasise concepts learnt in class (and also for the internal assessment task) whilst allowing students to use knowledge of their own home countries if they wish in case studies.

Aims and Objectives

The aims of the course at both higher level and standard level are to enable students to:

- develop a global perspective and a sense of world interdependence
- develop an understanding of the interrelationship between people, place and the environment
- develop a concern for the quality of the environment and an understanding of the need to plan and manage for present and future generations
- appreciate the relevance of geography in analysing contemporary world issues and develop and modify values and attitudes in relation to geographical problems and issues
- recognize the need for social justice, equality and respect for others; appreciate diversity; combat bias, prejudice and stereotyping
- develop an appreciation of the range of geographical methodologies and apply appropriate techniques of inquiry.

Course Content

Geographical skills - integrated throughout the course

G11+G12 (NEW syllabus Sept. 2017):

Part 1: Geographic themes - option topics (2 at SL/3 at HL)

1. Leisure, Tourism and Sport
2. Geophysical hazards
3. Oceans and coastal margins (HL ONLY - GRADE 12)

Part 2: SL and HL Core topics - Geographic perspectives: global change

1. Population distribution - changing population
2. Global climate - vulnerability and resilience
3. Global resource consumption and security

Part 3: HL ONLY extension - Geographic perspectives: global interactions

1. Power, places and networks
2. Human development and diversity
3. Global risks and resilience

Internal Assessment Fieldwork (SL/HL) DATA FIELD TRIP AND WRITE UP

Fieldwork, leading to one written report based on a fieldwork question.

Includes first-hand data collection and analysis of data with evaluation (e.g. Tourism).

Example: Study of the impacts of tourism in the Gredos region of Spain

Worth 20% (SL) or 25% (HL) of the final marks.

Assessment

Regular in-class assessment is conducted throughout the two years, emphasising the development of geographical knowledge and skills, plus decision-making and the presentation of balanced and informed arguments. Different learning styles are recognized through the variety of methods in which students will be assessed in class, including timed tests, questions from past papers, independent and group projects, posters, debates, short quizzes, presentations and continuous assessment of participation.

Use of exam past papers will be assessed with official IB diploma grading levels (7 highest to 1 lowest).

There are also opportunities for CAS and EE links with topics studied - e.g. Environmental clean-up in a national park/Environmental mapping of an area etc.

Resources

NEW SYLLABUS (SEPT. 2017) - *GEOGRAPHY IB DIPLOMA: GEOGRAPHY COURSE COMPANION* (Oxford) 2nd edition for new syllabus specification (all topics in one volume)
Garrett Nagle and Briony Cooke

NEW - G12 (SEPT. 2018) - *GEOGRAPHY SL/HL CORE: GLOBAL CHANGE STUDY AND REVISION GUIDE* - Simon Oakes

NEW - G12 (SEPT. 2018) - *GEOGRAPHY HL CORE EXTENSION: GLOBAL INTERACTIONS STUDY AND REVISION GUIDE* - Simon Oakes

Useful resources (old syllabus with some crossover content):

GEOGRAPHY IB DIPLOMA: PATTERNS AND CHANGE (Cambridge): Paul Guinness

GEOGRAPHY IB DIPLOMA: GEOGRAPHY COURSE COMPANION(Oxford):
Garrett Nagle and Briony Cooke

GEOGRAPHY IB DIPLOMA: GLOBAL INTERACTIONS (Cambridge): Paul Guinness

Other useful resources:

Geography: An Integrated Approach. David Waugh

Geography for AS. Clive Hart, ed.

Geography for A2. Clive Hart, ed.

Advanced geography. Nagle

Essential Mapwork skills. Ross

Geography Dictionary, 2nd Edition. Philips.

Useful revision websites: www.geographypods.com (IB diploma tab), www.geo41.com (IB tab), <https://www.thegeographeronline.net> (IB tab). The full syllabus details for all topics are on Managebac. There is also ample opportunity to develop detailed revision notes and use a range of revision strategies throughout the course.

IB Economics

Nature of the subject

The study of economics is essentially about dealing with scarcity, resource allocation and the methods and processes by which choices are made in the satisfaction of human wants. Economics uses scientific methodologies that include quantitative and qualitative elements.

The course emphasises the economic theories of microeconomics, which deal with variables affecting individuals, firms and markets, and the economic theories of macroeconomics, which deal with variables affecting countries, governments and societies. These theories are not to be studied in a vacuum—rather, they are to be applied to real-world issues. Prominent among these issues are fluctuations in economic activity, international trade, economic development and environmental sustainability.

The course encourages students to develop international perspectives, fosters a concern for global issues, and raises students' awareness of their own responsibilities at a local, national and international level

Aims and objectives:

- develop a critical understanding of a range of economic theories, models, ideas and tools in the areas of microeconomics, macroeconomics and the global economy
- apply economic theories, models, ideas and tools, and analyse economic data to understand and engage with real-world economic issues and problems facing individuals and societies
- develop a conceptual understanding of individuals' and societies' economic choices, interactions, challenges and consequences of economic decision-making.

Main content or themes

The IB Economics course is broken down into 4 for both HL and SL.

Unit 1: Introduction to economics

- 1.1. What is economics?
- 1.2. How do economists approach the world?

Unit 2: Microeconomics

- 2.1. Demand
- 2.2. Supply
- 2.3. Competitive market equilibrium
- 2.4. Critique of the maximising behaviour of consumers and producers
- 2.5. Elasticity of demand
- 2.6. Elasticity of supply
- 2.7. Role of government in microeconomics
- 2.8. Market failure—externalities and common pool or common access resources
- 2.9. Market failure—public goods
- 2.10. Market failure—asymmetric information

- 2.11. Market failure—market power
- 2.12. The market's inability to achieve equity

Unit 3: Macroeconomics

- 3.1. Measuring economic activity and illustrating its variations
- 3.2. Variations in economic activity — aggregate demand and aggregate supply
- 3.3. Macroeconomic objectives
- 3.4. Economics of inequality and poverty
- 3.5. Demand management (demand-side policies) — monetary policy
- 3.6. Demand management — fiscal policy
- 3.7. Supply-side policies

Unit 4: The global economy

- 4.1. Benefits of international trade
- 4.2. Types of trade protection
- 4.3. Arguments for and against trade control/protection
- 4.4. Economic integration
- 4.5. Exchange rates
- 4.6. Balance of payments
- 4.7. Sustainable development
- 4.8. Measuring development
- 4.9. Barriers to economic growth and/or economic development
- 4.10. Economic growth and/or economic development strategies

Assessment

Throughout the 2-year course the students will have a variety of assessments, although these will mainly be based on previous exam style questions to build familiarity and confidence in answering these styles of questions.

The final grade is composed of external assessment (exams) and internal assessment.

Paper	Format of assessment	SL weighting	HL weighting
1	Extended response (essay) paper based on all units of the syllabus	30%	20%
2	Data response paper based on all units of the syllabus	40%	30%
3	Policy paper based on all units of the syllabus, including some Maths-based questions	-	30%
Internal Assessment	Three commentaries based on different units of the syllabus (except the introductory unit) and from published extracts from the news media, analysed using different key concepts	30%	20%

IB Physics

Nature of the subject

Physics is the most fundamental of the experimental sciences, as it seeks to explain the universe itself from the very smallest particles to the vast distances between galaxies.

At the school level both theory and experiments complement one another naturally, as they do in the wider scientific community. The Diploma Programme physics course allows students to develop practical skills and techniques and increase their abilities in the use of mathematics, the language of physics. It also allows students to develop interpersonal and digital communication skills which are essential in modern scientific endeavour and are important, transferable skills in their own right.

Physics is, also, a human activity, and students need to be aware of the context in which physicists work. Illuminating its historical development places the knowledge and the process of physics in a context of dynamic change, in contrast to the static context in which physics has sometimes been presented. This can give students insights into the human side of physics: the individuals; their personalities, times and social milieux; their challenges, disappointments and triumphs.

The Diploma Programme physics course includes the essential principles of the subject but it also, through selection of an option, allows some flexibility to tailor the course to meet the needs and interests of the students.

Adapted from the IB Diploma Programme Physics guide, 1st assessment 2016 (Feb 2014)

Aims and objectives:

The Physics course reflects the general Group 4 subject aims, and intended for students to ...

- appreciate scientific study and creativity within a global context
- acquire, apply and use a body of knowledge, methods and techniques that characterise physics and related technologies
- develop an ability to analyse, evaluate and synthesise scientific information
- develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
- develop experimental and investigative scientific skills
- develop and apply 21st-century communication skills in the study of science
- become critically aware of the ethical implications of using science and technology
- develop an appreciation of the possibilities and limitations of science and technology
- develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.

The subject also fully embodies the IB learner profile, requiring students to be inquirers, knowledgeable, thinkers, communicators, principled, open-minded, caring (acting to make a positive

difference in the world), risk-takers (determined, resourceful and resilient in the face of challenges), balanced and reflective.

Adapted from the IB Diploma Programme Physics guide, 1st assessment 2016 (Feb 2014)

Main content or themes:

The syllabus for the Diploma Programme physics course is divided into three parts:

- Core topics, studied by all Standard Level (SL) and Higher Level (HL) students
- Additional higher level (AHL) material studied by HL students only
- One optional topic with core and AHL parts, which is studied by the whole class

1. Measurements and uncertainties (core)
 2. Mechanics (core)
 3. Thermal physics (core)
 4. Waves (core)
 5. Electricity and magnetism (core)
 6. Circular motion and gravitation (core)
 7. Atomic, nuclear and particle physics (core)
 8. Energy production (core)
 9. Wave phenomena (AHL)
 10. Fields (AHL)
 11. Electromagnetic induction (AHL)
 12. Quantum physics and nuclear physics (AHL)
- A. Relativity (option)
 - B. Engineering physics (option)
 - C. Imaging (option)
 - D. Astrophysics (option)

The practical work for the Diploma Programme physics course is also divided into three parts:

- A 10 hour internally assessed individual investigation, sometimes called the IA (Internal Assessment), chosen in consultation with the class teacher
- The Practical Scheme of Work (PSOW), a compulsory programme of additional practical activities reflecting the subject topics studied, as detailed above
- The group 4 project

Assessment

Students will be assessed for factual and skills-based knowledge, including problem solving skills and practical laboratory skills on the basis of tasks set in class and for homework. In addition, the usual school mid-year and end-of-year exams will be augmented by end-of-topic tests.

Mathematical requirements of the course:

This course requires an ability to use mathematical techniques covered in the IGCSE and IBDP Mathematics courses, although not all of the following will be required from the very beginning of the course. Students taking the course must be able to perform the basic arithmetic functions, carry out calculations involving means, decimals, fractions, percentages, ratios, approximations and reciprocals, carry out manipulations with trigonometric functions, carry out manipulations with logarithmic and exponential functions (HL only), use standard notation, understand direct and inverse proportion, solve simple algebraic equations and linear simultaneous equations, plot and interpret graphs and understand the significance of gradients, changes in gradients, intercepts and areas, draw lines of best fit and maximum and minimum gradients with relative accuracy (by eye) taking into account all uncertainty bars, interpret data presented in various forms (including various graphical forms), represent arithmetic mean using \bar{x} notation and express uncertainties to one or two significant figures, with justification.

Adapted from the IB Diploma Programme Physics guide, 1st assessment 2016 (Feb 2014)

IB Chemistry

Nature of the Subject

The course allows students to develop an understanding and familiarity with a specific body of knowledge, and an awareness of the way in which scientists work and communicate throughout the world. The Higher Level course offers an in-depth study of modern chemistry and provides a sound preparation for college and university courses. Standard Level students fall into two categories: those with little or no background who are taking it as their required science subject and those who have a good science background but who do not intend to specialise in this area.

A common curriculum model applies to all I.B. science programs. A core of material is studied by all students and supplemented by an option topic. Higher Level students study the core topics and an option. Practical laboratory work is an integral part of the course and contributes up to 20 % of the final IBDP grade.

The practical scheme of work also includes the "Group 4 project" which emphasises interdisciplinary cooperation and provides all students with an opportunity to appreciate both the implications and the limitations of the scientific method.

Chemistry is a central science and chemical principles underpin the physical environment in which we live.

As well as being an academic subject in its own right, it is also a prerequisite for many other courses in higher education, such as medicine, biological and environmental sciences. It is a logical subject much valued by professions outside of science such as law, accountancy and politics. The course offers the opportunity to combine academic study with the acquisition of practical and manipulative skills.

Considerable emphasis is placed on learning through practical work in the laboratory, and the use of information and Communication Technology. It is expected that students embarking on the course will read around the subject, be curious, and be prepared to challenge the ideas and facts they encounter.

All the experimental science programs aim to:

- Provide opportunities for scientific study and creativity within global contexts which should stimulate and challenge students
- Provide students with a body of knowledge & techniques which they can then apply when solving
- Enable students to apply and use a body of knowledge, methods and techniques, which characterise science and technology
- Develop an ability to analyse, evaluate and synthesise scientific information
- Engender an awareness of the need for, and the value of, effective collaboration and communication during scientific activities
- Develop experimental and investigative scientific skills
- Develop and apply the student's information technology skills in the study of science
- Raise awareness of the moral/ethical, social economic and environmental implications of using science
- Develop an appreciation of the possibilities and limitations associated with science and scientists

- Encourage an understanding of the relationship between scientific disciplines and emphasise the nature of the scientific method.

SL and HL 95 and 155 hours respectively

- Stoichiometry
- Atomic Structure
- Periodicity
- Structure and Bonding
- Energetics
- Kinetics
- Equilibrium
- Acid and Bases
- Oxidation and Reduction
- Organic Chemistry
- Measurement and data processing

Options:

- Materials
- Biochemistry
- Energy
- Medicinal Chemistry

The course is supported by the text:

Chemistry for the IB Diploma 2nd Edition (Cambridge) : Steve Owen

Assessment

Students are expected to produce some lab reports digitally. They will have experience of using Vernier data loggers and process and present experimental data using spreadsheets and Logger-Pro software.

Students will be tested on their understanding and use of scientific concepts and their experimental skills.

The course assessment is based on student performance in homework, practical work, end of unit tests, mid-year, and end of year exams. The Approaches to Learning grade will reflect the student's general enthusiasm and interest for the subject, their attention to safety in experimental work, their self motivation and ability to work in a group, their ability to use ICT effectively and their perseverance in solving problems. It is the expectation that both diploma and certificate candidates will sit the I.B exam after following the course for two years.

Nature of the subject

Biology is the study of life. The first organisms appeared on the planet over 3 billion years ago and, through reproduction and natural selection, have given rise to the 8 million or so different species alive today. An interest in life is natural for humans; not only are we living organisms ourselves, but we depend on many species for our survival, are threatened by some and co-exist with many more. Our understanding of living organisms only started to grow rapidly with the advent of techniques and technologies developed in the 18th and 19th centuries, not least the invention of the microscope and the realisation that natural selection is the process that has driven the evolution of life.

Biologists attempt to understand the living world at all levels using many different approaches and techniques. At one end of the scale is the cell, its molecular construction and complex metabolic reactions. At the other end of the scale biologists investigate the interactions that make whole ecosystems function. Many areas of research in biology are extremely challenging and many discoveries remain to be made.

Biology is still a young science and great progress is expected in the 21st century. This progress is sorely needed at a time when the growing human population is placing ever greater pressure on food supplies and on the habitats of other species, and is threatening the very planet we occupy.

Integral to the Biology course is students' experiences in the laboratory or in the field. Practical activities allow students to interact directly with natural phenomena and secondary data sources. The opportunity for hands-on experimentation, allows students to carry out some of the same processes that scientists undertake. Experimentation allows students to experience the nature of scientific thought and investigation.

The IB Diploma Programme Biology course includes the essential principles of the subject but also, through selection of an option, allows teachers some flexibility to tailor the course to meet the needs of their students.

Adapted from the IB Diploma Programme Biology guide, 1st assessment 2016 (Feb 2014)

Aims and objectives:

The aims of the IBDP Biology curriculum reflect the aims of all Group 4 subjects, including:

- appreciating scientific study and creativity within a global context through stimulating and challenging opportunities
- acquiring a body of knowledge, methods and techniques that characterise science and technology

- applying and using a body of knowledge, methods and techniques that characterise science and technology
- developing an ability to analyse, evaluate and synthesise scientific information
- developing a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
- developing experimental and investigative scientific skills including the use of current technologies
- developing and applying 21st century communication skills in the study of science
- becoming critically aware, as global citizens, of the ethical implications of using science and technology
- developing an appreciation of the possibilities and limitations of science and technology
- developing an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.

Main content or themes

The syllabus for the Diploma Programme Biology course is divided into three parts:

- Core topics, studied by Standard Level (SL) and Higher Level (HL) students
- Additional higher level (AHL) material studied by HL students only
- One optional topic studied by the whole class

Standard Level Topics:

1. Cell Biology
2. Molecular Biology
3. Genetics
4. Ecology
5. Evolution and Biodiversity
6. Human Physiology

Higher Level Topics:

7. Nucleic acids
8. Metabolism, Cell Respiration and Photosynthesis
9. Plant Biology
10. Genetics and evolution
11. Animal Physiology

Options:

- A. Neurobiology and behaviour
- B. Biotechnology and bioinformatics
- C. Ecology and conservation
- D. Human physiology

The practical work for the Diploma Programme Biology course is also divided into three parts:

- A 10 hour internally assessed individual investigation, sometimes called the IA (internal assessment), chosen in consultation with the class teacher
- The Practical Scheme of Work (PSOW), a compulsory programme of additional practical activities reflecting the subject topics studied, as detailed above
- The group 4 project

Assessment

Throughout the 2-year course the students will have a variety of assessments, although these will mainly be based on previous exam style questions and IB Internal Assessment criteria to build familiarity and confidence in answering these styles of questions.

The final grade is composed of external assessment (exams) and internal assessment.

Paper	Format of assessment	SL weighting	HL weighting
1	Multiple choice paper based on all units of the syllabus	20%	20%
2	Data analysis, short and extended response questions based on all units of the syllabus	40%	36%
3	Short-answer practical skills based on prescribed practical methods from each unit of the syllabus AND one of the option topics.	20%	24%
Internal Assessment	<ul style="list-style-type: none"> • Individual investigation: research project based on an experiment of the student's own design • Group 4 project: interdisciplinary group project 	20%	20%

IB Environmental Systems and Societies (SL only)

Nature of the subject

ESS is an interdisciplinary course that is offered only at standard level (SL). As an interdisciplinary course, ESS is designed to combine the methodology, techniques and knowledge associated with group 4 (sciences) with those associated with group 3 (individuals and societies).

ESS is a complex course, requiring a diverse set of skills from its students. It is firmly grounded in both a scientific exploration of environmental systems in their structure and function and in the exploration of cultural, economic, ethical, political, and social interactions of societies with the environment. As a result of studying this course, students will become equipped with the ability to recognize and evaluate the impact of our complex system of societies on the natural world. The interdisciplinary nature of the course requires a broad skill set from students and includes the ability to perform research and investigations and to participate in philosophical discussion.

The course promotes holistic thinking about environmental issues. It is recognized that to understand the environmental issues of the 21st century and suggest suitable management solutions, both the human and environmental aspects must be understood. Students should be encouraged to develop solutions from a personal to a community and to a global scale. Through the exploration of cause and effect, the course investigates how values interact with choices and actions, resulting in a range of environmental impacts. Students develop an understanding that the connections between environmental systems and societies are diverse, varied and dynamic. The complexity of these interactions challenges those working towards understanding the actions required for effective guardianship of the planet and sustainable and equitable use of shared resources.

Adapted from the IB Diploma Programme Biology guide, 1st assessment 2016 (Feb 2014)

Aims and objectives:

The aims of the ESS course are to enable students to:

1. Acquire the knowledge and understandings of environmental systems at a variety of scales
2. Apply the knowledge, methodologies and skills to analyse environmental systems and issues at a variety of scales
3. Appreciate the dynamic interconnectedness between environmental systems and societies
4. Value the combination of personal, local and global perspectives in making informed decisions and taking responsible actions on environmental issues
5. Be critically aware that resources are finite, and that these could be inequitably distributed and exploited, and that management of these inequities is the key to sustainability
6. Develop awareness of the diversity of environmental value systems
7. Develop critical awareness that environmental problems are caused and solved by decisions made by individuals and societies that are based on different areas of knowledge
8. Engage with the controversies that surround a variety of environmental issues
9. Create innovative solutions to environmental issues by engaging actively in local and global contexts.

Main content or themes

The course is separated into the following topics (although due to the interdisciplinary nature of the course these topics will often be taught concurrently)

Topic 1: Foundations of environmental systems and societies

Topic 2: Ecosystems and ecology

Topic 3: Biodiversity and conservation

Topic 4: Water and aquatic food production systems and societies

Topic 5 :Soil systems and terrestrial food production systems and societies

Topic 6: Atmospheric systems and societies

Topic 7: Climate change and energy production

Topic 8: Human systems and resource use

The practical work for the Diploma Programme ESS course is divided into two parts:

- A 10 hour internally assessed individual investigation, also called the IA (internal assessment), chosen in consultation with the class teacher
- The Practical Scheme of Work (PSOW), a compulsory programme of additional practical activities reflecting the subject topics studied, as detailed above

Assessment

Throughout the 2-year course the students will have a variety of assessments, although these will mainly be based on previous exam style questions and IB Internal Assessment criteria to build familiarity and confidence in answering these styles of questions.

The final grade is composed of external assessment (exams) and internal assessment.

Paper	Format of assessment	Overall weighting
1	Case Study: Short-answer questions based on an unseen case study	25%
2	Short answer and essay questions based on all sections of the syllabus.	50%
Internal Assessment	<ul style="list-style-type: none">• Individual investigation: research project based on an experiment of the student's own design	25%

IB Mathematics Higher Level Grades 11-12

Nature of the Subject

This course caters for students with a good background in mathematics 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.

The nature of the subject is such that it focuses on developing important mathematical concepts in a comprehensible, coherent and rigorous way. This is achieved by means of a carefully balanced approach. Students are encouraged to apply their mathematical knowledge to solving problems set in a variety of meaningful contexts. Development of each topic should feature justification and proof of results. Students embarking on this course should expect to develop insight into mathematical form and structure and should be intellectually equipped to appreciate the links between concepts in different topic areas. They should also be encouraged to develop the skills needed to continue their mathematical growth in other learning environments.

The internally assessed component - the exploration - offers students a framework for developing independence in their mathematical learning through engaging in mathematical investigation and mathematical modelling. Students will be provided with opportunities to take a considered approach to these activities, and to explore different ways of approaching a problem. The exploration also allows students to work without the time constraints of a written examination and to develop skills in communicating mathematical ideas.

Extensive use is made of a GDC (Graphic Display Calculator: model TI-84 in most cases though some other models are also allowed by IB DP regulations) throughout the course in both the development and the application of the topics.

Students also make extensive use of the digital interactive copies of **Haese Mathematics** textbooks, some special software for geometrical constructions, graphing and making numerical experiments and the educational contents on the Google Drive (GD).

The course is a demanding one, requiring students to study a broad range of mathematical topics through a number of different approaches and to varying degrees of depth. Students wishing to study mathematics in a less rigorous environment should therefore opt for one of the standard level courses.

The course consists of the study of six core topics and one option topic

Aims and Objectives

The course aims to enable students to:

- appreciate the multicultural and historical perspectives of all group 5 courses
- enjoy the courses and develop an appreciation of the elegance, power and usefulness of the subjects
- develop logical, critical and creative thinking
- develop an understanding of the principles and nature of the subject
- employ and refine their powers of abstraction and generalisation

- develop patience and persistence in problem solving
- appreciate the consequences arising from technological developments
- transfer skills to alternative situations and to future developments
- communicate clearly and confidently in a variety of contexts.

Having followed any one of the mathematics courses in group 5, students are expected to know and use mathematical concepts and principles. In particular, students must be able to:

- read, interpret and solve a given problem using appropriate mathematical terms
- organise and present information and data in tabular, graphical and/or diagrammatic forms
- know and use appropriate notation and terminology
- formulate a mathematical argument and communicate it clearly
- select and use appropriate mathematical strategies and techniques
- demonstrate an understanding of both the significance and the reasonableness of results
- recognize patterns and structures in a variety of situations, and make generalisations
- recognize and demonstrate an understanding of the practical applications of mathematics
- use appropriate technological devices as mathematical tools
- demonstrate an understanding of and the appropriate use of mathematical modelling.

Course Content

Core

All topics in the core are compulsory. Students must study all the subtopics in each of the topics in the syllabus as listed in this guide. Students are also required to be familiar with the topics listed as presumed knowledge (PK).

Topic 1: Numbers and Algebra

- Arithmetic sequences and series; sum of finite arithmetic series; geometric sequences and series; sum of finite and infinite geometric series.
- Sigma notation.
- Applications
- Exponents and logarithms.
- Laws of exponents; laws of logarithms, Change of base.
- Counting principles, including permutations and combinations.
- The binomial theorem.
- Proof by mathematical induction.
- Complex numbers: the number i , terms real part, imaginary part, conjugate, modulus and argument. Cartesian form $z = a + bi$
- Sums, products and quotients of complex numbers.
- Modulus–argument (polar) form.
- The complex plane.
- Powers of complex numbers: de Moivre's theorem.
- n^{th} roots of a complex number.
- Conjugate roots of polynomial equations with real coefficients.

- Solutions of systems of linear equations (a maximum of three equations in three unknowns), including cases where there is a unique solution, an infinity of solutions or no solution.

Topic 2: Functions and equations

- Concept of a function, domain, range; image (value).
- Odd and even functions.
- Composite functions. Identity function.
- One-to-one and many-to-one functions. Inverse function f^{-1} , including domain restriction. Self-inverse functions.
- The graph of a function; its equation $y = f(x)$.
- Investigation of key features of graphs, such as maximum and minimum values, intercepts, horizontal and vertical asymptotes and symmetry, and consideration of domain and range.
- The graphs of the functions with absolute value sign and reciprocal functions.
- Transformations of graphs: translations; stretches; reflections in the axes. The graph of the inverse function as a reflection in $y = x$.
- The rational function and its graph. The exponential and logarithmic functions and their graphs. Polynomial functions and their graphs.
- The factor and remainder theorems. The fundamental theorem of algebra.
- Solving quadratic equations using the quadratic formula. Use of the discriminant to determine the nature of the roots.
- Solving polynomial equations both graphically and algebraically.
- Sum and product of the roots of polynomial equations.
- Solution of $a^x = b$ using logarithms.
- Use of technology to solve a variety of equations, including those where there is no appropriate analytic approach.
- Solutions of $g(x) \geq f(x)$.
- Graphical or algebraic methods, for simple polynomials up to degree 3.
- Use of technology for these and other functions.

Topic 3: Geometry and trigonometry

- The circle: radian measure of angles. Length of an arc; area of a sector.
- Definition of $\cos\theta$, $\sin\theta$ and $\tan\theta$ in terms of the unit circle. Exact values of \sin , \cos and \tan at a few particular points and their multiples.
- Definition of the reciprocal trigonometric ratios $\sec\theta$, $\csc\theta$ and $\cot\theta$
- Pythagorean identities.
- Compound angle identities. Double angle identities.
- Composite functions of the form $f(x) = a \sin(bx + c) + d$ Applications.
- The inverse functions $y = \arcsin(x)$, $y = \arccos(x)$, $y = \arctan(x)$; their domains and ranges; their graphs
- Algebraic and graphical methods of solving trigonometric equations in a finite interval, including the use of trigonometric identities and factorization
- The cosine rule.
- The sine rule includes the ambiguous case.
- Area of a triangle as $\frac{1}{2} ab \sin C$.
- Applications.
- Representation of vectors using directed line segments.
- Unit vectors; base vectors \mathbf{i} , \mathbf{j} , \mathbf{k} .
- Components of a vector

- the sum and difference of two vectors
- the zero vector $\mathbf{0}$, the vector $-\mathbf{v}$
- multiplication by a scalar
- magnitude of a vector
- position vectors
- The definition of the scalar product of two vectors. Properties of the scalar product
- The angle between two vectors. Perpendicular vectors; parallel vectors
- Vector equation of a line in two and three dimensions: $\mathbf{r} = \mathbf{a} + \lambda \mathbf{b}$.
- Simple applications to kinematics. The angle between two lines.
- Coincident, parallel, intersecting and skew lines; distinguishing between these cases. Points of intersection
- The definition of the vector product of two vectors. Properties of the vector product.
- Geometric interpretation of $\mathbf{v} \cdot (\mathbf{w} \times \mathbf{v})$.
- Vector equation of a plane. Use of normal vector to obtain the form $\mathbf{r} \cdot \mathbf{n} = a$
- Cartesian equation of a plane.
- Intersections of: a line with a plane; two planes; three planes. Angle between: a line and a plane; two planes.

Topic 4: Statistics and probability

- Concepts of population, sample, random sample and frequency distribution of discrete and continuous data. Grouped data: mid-interval values, interval width, upper and lower interval boundaries. Mean, variance, standard deviation.
- Concepts of trial, outcome, equally likely outcomes, sample space (U) and event. The probability of an event A as $P(A) = n(A)/n(U)$
- The complementary events A and A' (not A). Use of Venn diagrams, tree diagrams, counting principles and tables of outcomes to solve problems.
- Combined events; the formula for $P(A \cup B)$. Mutually exclusive events.
- Conditional probability; the definition $P(B|A) = P(A \cap B)/P(A)$
- Independent events; the definition $P(A|B) = P(A) = P(A|B')$.
- Use of Bayes' theorem for a maximum of three events.
- Concept of discrete and continuous random variables and their probability distributions. Definition and use of probability density functions.
- Expected value (mean), mode, median, variance and standard deviation.
- Binomial distribution, its mean and variance. Normal distribution.
- Properties of the normal distribution. Standardisation of normal variables.

Topic 5: Calculus

- Informal ideas of limit, continuity and convergence. Definition of derivative from first principles.
- The derivative is interpreted as a gradient function and as a rate of change. Finding equations of tangents and normal.
- Identifying increasing and decreasing functions.
- The second derivative. Higher derivatives.
- Derivatives of x^n , $\sin x$, $\cos x$, $\tan x$, e^x and $\ln x$
- Differentiation of sums and multiples of functions.
- The product and quotient rules.
- The chain rule for composite functions.
- Related rates of change.
- Implicit differentiation.
- Derivatives of $\sec x$, $\csc x$, $\cot x$, a^x , $\log_a x$, $\arcsin x$, $\arccos x$ and $\arctan x$

- Local maximum and minimum values. Optimization problems. Points of inflection with zero and non-zero gradients. Graphical behaviour of functions, including the relationship between the graphs of f , f' and f''
- Indefinite integration as anti-differentiation. Indefinite integral of x^n , $\sin x$, $\cos x$ and e^x . Other indefinite integrals using the results of differentiation of other elementary functions. The composites of any of these with a linear function.
- Anti-differentiation with a boundary condition to determine the constant of integration. Definite integrals. Area of the region enclosed by a curve and the x-axis or y-axis in a given interval; areas of regions enclosed by curves.
- Volumes of revolution about the x-axis or y-axis.
- Kinematic problems involving displacement s , velocity v and acceleration a . Total distance travelled.
- Integration by substitution.
- Integration by parts.
- The evaluation of limits and using l'Hopital's Rule.
- First order differential equations.
- Maclaurin series to obtain expansion for specific functions.

Option.

The aims of this option are to introduce limit theorems and convergence of series, and to use calculus results to solve differential equations.

Topic 9: Calculus

Infinite sequences of real numbers and their convergence or divergence.

Convergence of infinite series. Tests for convergence: comparison test; limit comparison test; ratio test; integral test.

The p -series.

Series that converge absolutely. Series that converge conditionally. Alternating series. Power series: radius of convergence and interval of convergence. Determination of the radius of convergence by the ratio test

Continuity and differentiability of a function at a point.

Continuous functions and differentiable functions

The integral as a limit of a sum; lower and upper Riemann sums.

Fundamental theorem of calculus.

Improper integrals.

Mathematical Exploration

Internal assessment in mathematics HL is an individual exploration. This is a piece of written work that involves investigating an area of mathematics.

Resources

Mathematics for the international student. Mathematics HL (Core). 3rd edition (Haese Mathematics)

Mathematics for the international student. Mathematics HL (Options) (Haese & Harris Publications)

Thomas' Calculus. 11th edition (Pearson Education. Addison-Wesley)

Mathematics Higher Level. (Oxford University Press). J.Harcet and others.

Mathematics Higher Level: Calculus. (Oxford University Press). J.Harcet and others.

Pure Mathematics: 1st Course ; (Longman), [J.K. Backhouse](#), [S.P.T. Houldsworth](#)

Pure Mathematics: 2nd Course (Longman), [J.K. Backhouse](#), [S.P.T. Houldsworth](#);

Understanding Pure Mathematics (Oxford), A. J. Sadler and D. W. S.Thorning,

Web Resources

Channels:

MIT Open course Ware <https://www.youtube.com/user/MIT>

Patrick JMT <http://patrickjmt.com/>

Harder HSC Maths <https://www.youtube.com/user/harderhscmaths>

Professor Leonard <https://www.youtube.com/user/professorleonard57>

Khan Academy <http://www.khanacademy.org/>

Math is Power <http://mathispower4u.yolasite.com/>

Exam Solutions <http://www.examsolutions.net/maths-revision/index.php>

Marcus du Sautoy on BBC – any available video

Occasional related videos from different sites

Assessment

The course assessment is based on student performance in homework, classwork, tests and mock exams, internal assessments tasks. The Approaches to Learning grade will reflect the student's general enthusiasm and interest for the subject, their self motivation and ability to work individually and in a group, and their perseverance in solving problems. The Subject Skills grade will reflect the student's level of knowledge and understanding, their application and reasoning, their ability to communicate ideas and solutions clearly and precisely, and their mathematical insight. Overall assessment reflects students' following the IB Learner Profile principles. Finally the students are expected to take the official IB exam.

IB Mathematics: Analysis & Approaches Standard Level Grades 11-12

Nature of the Subject

There are two different mathematics courses offered at ISL: 'Analysis and Approaches' (AA) or 'Applications and Interpretation' (AI). The Analysis and Approaches or AA course, about which I write here, is for students who enjoy developing their mathematics to become fluent in the construction of mathematical arguments and develop strong skills in mathematical thinking. They will also be fascinated by exploring real and abstract applications of these ideas, with and without technology. Students who take Mathematics AA will be those who enjoy the thrill of mathematical problem solving and generalisation.

This course recognizes the need for analytical expertise in a world where innovation is increasingly dependent on a deep understanding of mathematics. This course includes topics that are both traditionally part of a pre-university mathematics course (for example, functions, trigonometry, calculus) as well as topics that are amenable to investigation, conjecture and proof, for instance the study of sequences and series.

The course allows the use of technology, as fluency in relevant mathematical software and hand-held technology is important regardless of choice of course. However, Mathematics AA has a strong emphasis on the ability to construct, communicate and justify correct mathematical arguments.

Mathematics AA is offered at standard (SL) and higher (HL) levels. Students who choose to do the course at SL should be comfortable in the manipulation of algebraic expressions and enjoy the recognition of patterns and understand the mathematical generalisation of these patterns.

Based on the IB Mathematics: Analysis and Approaches Guide (first assessment 2022-2023)

Aims and Objectives

The course aims to enable students to:

- develop a curiosity and enjoyment of mathematics, and appreciate its elegance and power
- develop an understanding of the concepts, principles and nature of mathematics
- communicate mathematics clearly, concisely and confidently in a variety of contexts
- develop logical and creative thinking, and patience and persistence in problem solving to instil confidence in using mathematics
- employ and refine their powers of abstraction and generalisation
- take action to apply and transfer skills to alternative situations, to other areas of knowledge and to future developments in their local and global communities
- appreciate how developments in technology and mathematics influence each other
- appreciate the moral, social and ethical questions arising from the work of mathematicians and the applications of mathematics
- appreciate the universality of mathematics and its multicultural, international and historical perspectives
- appreciate the contribution of mathematics to other disciplines, and as a particular "area of knowledge" in the TOK course

- develop the ability to reflect critically upon their own work and the work of others
- independently and collaboratively extend their understanding of mathematics.

Problem solving is central to learning mathematics and involves the acquisition of mathematical skills and concepts in a wide range of situations, including non-routine, open-ended and real-world problems. Having followed this mathematics course, students will be expected to demonstrate the following:

- Knowledge and understanding: Recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts.
- Problem solving: Recall, select and use their knowledge of mathematical skills, results and models in both abstract and real-world contexts to solve problems.
- Communication and interpretation: Transform common realistic contexts into mathematics; comment on the context; sketch or draw mathematical diagrams, graphs or constructions both on paper and using technology; record methods, solutions and conclusions using standardised notation; use appropriate notation and terminology.
- Technology: Use technology accurately, appropriately and efficiently both to explore new ideas and to solve problems.
- Reasoning: Construct mathematical arguments through use of precise statements, logical deduction and inference and by the manipulation of mathematical expressions.
- Inquiry approaches: Investigate unfamiliar situations, both abstract and from the real world, involving organising and analysing information, making conjectures, drawing conclusions, and testing their validity.

Based on the IB Mathematics: Analysis and Approaches Guide (first assessment 2021)

Course Content

The course consists of the study of five topics.

1. number and algebra
2. functions
3. geometry and trigonometry
4. probability and statistics
5. calculus

All topics are compulsory. Students are also required to be familiar with the material listed as ‘Prior Learning Topics’ in the IB Mathematics: Analysis and Approaches Guide (first assessment 2021) p26-27.

Mathematical Exploration

Internal assessment in SL Mathematics AA is by an individual exploration. This is an extended piece of written work that involves investigating an area of mathematics of the student’s choice. The exploration (often referred to as the Internal Assessment, or “IA”, is an integral part of the course and is compulsory for all students. It enables students to demonstrate the application of their skills and knowledge and to pursue their personal interests without the time limitations and other constraints that are associated with written examinations.

Resources

Mathematics: Analysis and Approaches Standard Level, Awada et al., (2019)

Assessment

The course assessment is based on student performance in homework, quizzes, end of unit tests, projects and end of year exams. The Approaches to Learning grade will reflect the student's general enthusiasm and interest for the subject, their self motivation and ability to work individually and in a group, and their perseverance in solving problems. The Subject Skills grade will reflect the student's level of knowledge and understanding, their reasoning and problem solving skills, their mathematical presentation (strategies shown, logic, rigour, notation, terminology, symbols, diagrams) and the reliability of their fundamental skills. It is the expectation that all students will sit the IB exam after following the course for two years.

Mathematics: Applications and Interpretation - Standard Level

Nature of the subject

This course, available at standard level (SL) is designed for students with a varied background and abilities who will not need mathematics in their future studies at University. It enables students to build confidence in mathematics and to develop their use of Mathematics tools in real life situations. The emphasis of the course is to develop an understanding of mathematical concepts, to develop mathematical reasoning and to develop problem solving in a wide range of contexts. The course includes an Internal Assessment : students must produce a piece of written work based on personal research, guided and supervised by the teacher. All throughout the course, students will learn how to use their calculator effectively. At ISL, we use this book :

Mathematics: Applications and interpretation - OXFORD.

Online website : www.myimaths.com

Aims and objectives:

- Enjoy the course, understand and appreciate the usefulness and beauty of Mathematics,
- Develop Mathematical intuition, logical and critical thinking and use it in real life problems,
- Develop patience and persistence in problem solving,
- transfer skills to alternative situations and to future developments,
- communicate clearly and confidently in a variety of contexts.
- read, interpret and solve a given problem using appropriate mathematical knowledge (Solving equations, rearranging equations, rounding a number to a given number of significant figures, using Pythagoras' theorem,)
- organize and present information and data in tabular, graphical and/or diagrammatic forms
- know and use appropriate notation and terminology

Main content or themes

TOPIC 1: Number and Algebra

TOPIC 2: Functions

TOPIC 3: Geometry and trigonometry

TOPIC 4: Statistics and probability

TOPIC 5: Calculus

Grade 11 : Topics taught

TOPIC 1: Number and Algebra

TOPIC 2: Functions

Ch5 - Modelling constant rates of change: linear functions.

Ch9 - Modelling relationships with functions: power functions.

TOPIC 3: Geometry and trigonometry

Ch1 - Measuring space : accuracy and 2D geometry

Ch2 - Representing space : no right angled trigonometry and volumes

Ch4 - Dividing up space : coordinate geometry, lines, Voronoi diagrams

TOPIC 4: Statistics and probability

Ch3 - Representing and describing Data : descriptive statistics

Ch6 - Modelling relationships: linear correlation of bivariate data.

Ch7 - Quantifying uncertainty: probability, binomial and normal distributions.

Ch8 - Testing for Validity: Spearman's, hypothesis testing and Chi squared test for Independence (8.1 and 8.2)

Grade 12 : Topics taught

TOPIC 1: Number and Algebra

TOPIC 2: Functions

Ch10 - Modelling rates of change: exponential and logarithmic functions.

Ch11 - Modelling periodic phenomena: trigonometric functions.

TOPIC 4: Statistics and probability

Ch8 - Testing for Validity: Spearman's, hypothesis testing and Chi squared test for Independence (8.3 and 8.4)

TOPIC 5: Calculus

Ch12 - Analyzing rates of change: differential calculus.

Ch13 - Approximating irregular spaces: integration.

Internal Assessment

Assessment

EXTERNAL ASSESSMENT

The 2 year program will be assessed by two external written examinations (80% of the final grade) and an exploration written in grade 12 (20% of the final grade).

INTERNAL ASSESSMENT at ISL

At ISL, students in grade 12 have one MOCK EXAM in January ; students in grade 11 have two internal exams (December and June) during which they work on real exam questions under real exam conditions.

During the year, homework and/or in class short tests are given on a weekly basis to assess the progress of each student.

Visual Arts

Nature of the subject

The diploma programme visual arts course is designed to offer students the opportunity to build on prior experience while encouraging them to develop and use new skills, techniques and ideas. The process involved in the study and production of visual arts is central to developing capable, inquiring and knowledgeable young people.

Aims and objectives

The diploma programme visual arts course enables students to engage in both practical investigation and aesthetic production, and in independent contextual, visual and critical investigation.

Main content or themes

The two year course is structured in a way that students discover, explore and refine through set assignments and personal investigation, enabling them to produce a well structured, coherent and original body of work.

On a weekly basis, students are asked to produce homework (3 hours at HL and 2 hours at SL) in their “journal/log” and to work on the making of art pieces in the studio.

Assessment

The IB diploma programme in visual arts is assessed based on 3 components.

- The comparative study (20% of the marks)
- The process portfolio (40% of the marks)
- The exhibition (40% of the marks)

At the end of the two years, the students hold an exhibition that displays their approaches to an individual topic. The exhibited pieces are carefully selected in order to communicate and share the artist’s intentions to an audience.

1. The comparative study.

An independent critical and contextual investigation that explores artworks, objects and artefacts from differing cultural contexts.

The CS is not an extended essay: it is an investigative comparison that should strike a balance between visual and written content.

Requirement: SL 10-15 pages, HL 10-15 Pages + 3-5 Pages

2. The process portfolio.

A documentation of the student’s artistic experience during the course, both visual and written.

Students submit carefully selected materials that show their experimentation, exploration, manipulation and refinement of a variety of visual arts activities during the two-year course.

Requirement: SL students submit 9–18 pages; HL students submit 13–25 pages

3. The exhibition.

Students present a body of work accompanied by reflection showing critical understanding and awareness of context.

What does it take to be successful in IB visual arts?

Students do not require any particular art training before joining the course.

Being open-minded, curious, playful, having an ability to generate ideas, being curious and inquisitive, experimenting with material, having a sense of aesthetic, enjoying bending rules and discussing established concepts and overall being creative in one way or another, are essential for being a good IB visual arts student.

Why choose this course?

The course enables students to go on a personal journey of discovery seeking and developing an understanding of themselves in connection to the world around them. They will build critical and analytical tools which they will make use of in both their personal and professional lives.

This course will be of interest to those who aim to study Visual arts at university or considering a job in the creative world, but also to those in search of exploring a passion and growing personal curiosity.

CAS Creativity, Activity, Service Grades 11-12

Nature of the CAS Program

Within the International Baccalaureate Diploma Program, students must complete the CAS component in order to receive the Diploma.

The Creativity, Activity, Service (CAS) requirements take the importance of life outside the world of scholarship seriously, providing a counterbalance to the academic self-absorption some students feel within a demanding school curriculum. The creative, physical and social development of human beings can be shaped by their own experiences. Participation in CAS encourages students to share their energies and special talents while developing awareness, concern and the ability to work cooperatively with others. The school's goal of educating the whole person and fostering more caring and socially responsible attitudes comes alive in an immediate way when students reach beyond themselves and their books. CAS is a framework for experiential learning, designed to involve students in new roles. The emphasis is on learning by doing real tasks that have real consequences and then reflecting on these experiences over time. The educational benefits of CAS apply within the school and within local, national and international communities.

CREATIVITY – From the mind – Where you make new things such as art or music.

ACTIVITY – From the body – Where you do things actively such as a sporting activity.

SERVICE – From the heart – Where you help others such as helping in primary classrooms.

Aims and Objectives

Having completed the CAS requirement, candidates should be able to demonstrate:

- self-confidence and modesty
- attitudes and values which respect human dignity and which transcend barriers of race, class, religion, gender and politics
- an awareness of humanitarian and environmental issues, and the development of an ethical position from a local, national and international perspective
- a willingness to interact meaningfully with others
- a sense of responsibility towards all members of the local, national and global communities and a commitment to be of value to those communities
- personal qualities of curiosity, honesty and self-criticism
- an ability to reflect on and to learn from experiences
- a spirit of discovery, commitment, initiative, determination and perseverance
- the ability to meet challenges and an awareness of personal limitations
- practical skills which can be used in the service of others and in a future career

Course Content

Students are expected (with the assistance of the CAS Coordinator) to devise and participate in a CAS program that will match their own interests, abilities and schedules. Every candidate should undertake CAS throughout the 2 years of the Diploma Program. He/she is required to participate in a variety of activities (around 3) within each area of Creativity, Activity, Service and at least one long term project. This is equivalent to approximately 3-4 hours per school week.

Possible CAS activities (that ISL students have been or are involved in) include:

- Model United Nations (club/conferences)
- Local CAS projects (e.g. Environmental clean up in a national park)
- School Council
- Running clubs for younger students (e.g. Hockey club)
- Assisting ISL staff in primary school classes (Maths/Literacy help etc.)
- School newspaper
- Designing ideas to enhance the ISL environment (younger students' play areas)
- Social help/physical assistance for elderly persons
- Environmental, creative and artistic projects: SAJ (Service Action Jeunes)
- Assisting teachers in a local school for children with special needs (Le Grapillon)
- Sports tournaments and competitions
- Sporting activities and coaching
- Art projects both in and out of school/Mural projects
- Drama Club/Drama productions
- Musical participation and creation
- Environmental and restoration projects
- Fundraising for charities
- Helping with national and international organisations dealing with issues of global importance such as mobility-impairment, anti-slavery, homelessness, refugees etc. (Handi Chiens, Restos du Coeur, Handicap International, No project, Education for All Morocco etc.). ISL has had some official links with Handi'Chiens, Restos du Coeur and EFA Morocco.
- Helping community based projects, working with other schools and centres
- Working with local council in the political sphere

In many ways, CAS is limited only by imagination!

It is a wonderful opportunity to continue doing things you love, try new things and develop new challenges, visit new places, meet new people and help others. Truly a life experience!!!

Requirements

CAS assessment requires the making of qualitative judgments according to performance criteria which encourage the students to show evidence of personal development in their attitudes, values and skills. By the end of the course the student should be able to prove that they have met the seven learning outcomes. These are:

- Identify your own strengths and develop areas for growth (Reflections)
- Demonstrate that challenges have been undertaken, developing new skills in the process (Either things you have never done before or developing further)
- Demonstrate how to initiate and plan a CAS experience (Your ideas and creativity)
- Show commitment and perseverance in CAS experiences (Long-term 6 months or more activities)
- Demonstrate the skills and recognize the benefits of working collaboratively (Being part of a team)
- Demonstrate engagement with issues of global significance (Mobility impairment, Homelessness, Refugees etc.)

- Recognize and consider the ethics of choices and actions (Those who are less fortunate than you/younger than you etc. and need to be treated with dignity and respect or environmental ethics to respect our planet and its resources etc.)

Each IB student is expected to keep an electronic portfolio of his/her CAS experiences on the ManageBac system during the time in which he/she is involved in the programme.

The diary should include the following:

- Where the activity was carried out
- Which part of the CAS program it relates to (Creativity, Activity or Service)
- The duration of the activity
- Reflective comments on their efforts.

For example :

- What challenges it presented and how problems were overcome
- How it led to working with others and having an impact on others
- How it has changed your way of looking at the world
- Which of the learning outcomes have been met through this experience

Records are kept on ManageBac and can include photos, video footage, audio footage, leaflets, creative designs etc. and it will be checked by CAS staff. There will be one-to-one interviews during the CAS program to give individual advice and guidance in order to help students maintain progress and meet the necessary outcomes.

CAS does not involve a formal examination, but you cannot graduate without having met the CAS learning outcomes!

The CAS component is supported by the text book CAS for IB (John Cannings et al.), support on Managebac and the organized sessions with the CAS co-ordinator at the start of Grade 11, as well as informal and formal meetings with the CAS co-ordinator.

Theory of Knowledge Grades 11-12

Nature of the Subject

The theory of knowledge (ToK) course plays a special role in the DP by providing an opportunity for students to reflect on the nature, scope and limitations of knowledge and the process of knowing. In this way, the main focus of ToK is not on students acquiring new knowledge but on helping students to reflect on, and put into perspective, what they already know. ToK underpins and helps to unite the subjects that students encounter in the rest of their DP studies. It engages students in explicit reflection on how knowledge is arrived at in different disciplines and areas of knowledge, on what these areas have in common and the differences between them.

Aims and Objectives

The aims of the Theory of Knowledge program are to lead students to reflect on and question the bases of their knowledge and experience so that they:

- to encourage students to reflect on the central question, “How do we know that?”, and to recognize the value of asking that question
- to expose students to ambiguity, uncertainty and questions with multiple plausible answers
- to equip students to effectively navigate and make sense of the world, and help prepare them
- to encounter novel and complex situations
- to encourage students to be more aware of their own perspectives and to reflect critically on their own beliefs and assumptions
- to engage students with multiple perspectives, foster open-mindedness and develop intercultural understanding
- to encourage students to make connections between academic disciplines by exploring underlying concepts and by identifying similarities and differences in the methods of inquiry used in different areas of knowledge
- to prompt students to consider the importance of values, responsibilities and ethical concerns relating to the production, acquisition, application and communication of knowledge.

Having followed the ToK course, students should be able to:

- demonstrate ToK thinking through the critical examination of knowledge questions
- identify and explore links between knowledge questions and the world around us
- identify and explore links between knowledge questions and areas of knowledge
- develop relevant, clear and coherent arguments
- use examples and evidence effectively to support a discussion
- demonstrate awareness and evaluation of different points of view
- consider the implications of arguments and conclusions.

Course Content

The ToK program is composed almost entirely of questions, which are used to study various themes and areas of knowledge:

Core theme: ***Knowledge and the knower***

This theme provides an opportunity for students to reflect on themselves as knowers and thinkers, and on the different communities of knowers to which we belong.

Optional themes:

Students will study at least **two** optional themes from the following.

- Knowledge and technology
- Knowledge and language
- Knowledge and politics
- Knowledge and religion
- Knowledge and indigenous societies

Areas of knowledge:

Students are required to study the following five areas of knowledge.

- History
- The human sciences
- The natural sciences
- The arts
- Mathematics

Resources

The course uses a range of resources from contemporary media and news, the internet and the students' other courses and interests.

Assessment

Students will be assessed on their ability to think critically about knowledge issues and their ability to make links between different areas of the course. This will be based on written work and class presentations. This work and their contribution to class discussion will be used to assess their report grades.

Type of assessment	Format of assessment	Weighting
Theory of knowledge essay	Students are required to write an essay in response to one of the six prescribed titles that are issued by the IB for each examination session.	67%
Theory of knowledge exhibition	Students are required to create an exhibition of three objects with accompanying commentaries that explores how ToK manifests in the world around us	33%

Secondary School Assessment - Principles of Assessment

The International School of Lyon recognises that teaching, learning and assessment are fundamentally interdependent. We are guided by the following principles;

Our **students**:

- have differing learning styles
- have different cultural experiences, expectations and needs
- perform differently according to the context of learning
- need to know their achievements and areas for improvement in the learning process
- should receive feedback that is positive and constructive
- have an active role to play in self assessment and peer assessment

In the **curriculum and instructional process** assessment

- forms an integral part of the planning/ assessment/ reporting cycle
- monitors the progress of student learning and achievement
- determines the effectiveness of teaching
- informs curriculum and assessment review
- utilises a variety of methods
- should be in a context that is relevant and motivating to students

The **wider world** requires

- feedback to parents and others, as appropriate
- transmission of relevant data to receiving institutions
- assessment and appraisal of a broad range of concepts, attitudes, knowledge & skills appropriate to an international and increasingly complex world

Assessment undertaken by the faculty must be in accordance with the school assessment principles.

Teachers are encouraged to make students aware of the assessment tools used before commencing any area of study.

All internal assessment should be designed to be formative in nature for the student and summative where appropriate.

Feedback to students should be prompt and supportive.

The faculty should keep a clear and accurate record of any assessment.

Why do we assess?

The International School of Lyon is involved in the process of assessment of its student body in order to:

- enhance the learning of the students
- monitor the progress of individual student learning and achievement
- determine the effectiveness of teaching
- inform curriculum review
- help evaluate suitability of courses
- inform others as appropriate, including, students, teachers, parents, receiving schools, universities

How do we assess?

by **gathering evidence & information** from the following sources:

- ongoing formative teacher assessment
- summative assessment tasks
- previous summative records
- parent consultations
- conversations with other adults who have knowledge
- the student as a learner

by **analysing** the above using professional knowledge and expertise

Who undertakes the assessments?

All students are assessed in curriculum areas by:

- the relevant staff in the faculty
- external agencies (IGCSE, IB)

Other assessments are valued and encouraged:

- student self assessment
- peer assessment

When do we assess?

- when students are engaged in both teacher initiated and student initiated activities
- when students are working with an adult
- when students are working independently in a group
- when students are working cooperatively
- when students are working alone
- when students are working on the school premises and on school activities elsewhere

SUBJECT SKILLS

Level	CRITERIA
NG	Special circumstances apply to the achievement of the student in terms of the objectives set. The award of this grade will require further documentation.
E Very poor	The student can recall simple content and shows some knowledge of basic concepts. S/he shows understanding with guidance. The student can apply learning in a limited variety of simple situations and is capable of analysis with assistance. The student is able to compare and contrast simple ideas. The student can add to the learning environment of the classroom through simple responses.
D Poor	The student can recall content and show some knowledge of concepts. S/he shows understanding with guidance. The student can apply learning in a variety of simple situations and is capable of related analysis. The student can evaluate and synthesise simple statements of facts and ideas with guidance. The student sometimes adds to the learning environment of the classroom through reflection and response.
C Satisfactory	The student has a reliable recall of content and shows some knowledge of more elaborate concepts. S/he shows some independent understanding. The student can apply learning in a variety of situations and is capable of appropriate analysis. The student can evaluate and synthesise simple statements of facts and ideas with some level of independence, occasionally showing insight. The student adds to the learning environment of the classroom through reflection and response.
B Good	The student has a reliable recall of a wide range of content and often shows knowledge of more elaborate concepts. S/he shows some independent understanding. The student can apply learning effectively in a variety of situations and is capable of appropriate analysis. The student can evaluate and synthesise statements of facts and ideas independently, showing creativity, originality and insight. The student frequently adds to the learning environment of the classroom through reflection and response.
B+ Very good	The student has a reliable recall of a wide range of content and shows knowledge of elaborate concepts, regularly demonstrating independent understanding. The student can apply learning effectively in a variety of complex situations and is capable of appropriate analysis. The student can evaluate and synthesise complex ideas proficiently, often showing creativity, originality and insight. The student consistently adds to the learning environment of the classroom through reflection and response.
A Excellent	The student has a reliable recall of a wide range of content and clearly shows knowledge of elaborate concepts, regularly demonstrating independent understanding. The student can apply learning effectively in a variety of complex and unfamiliar situations and is capable of appropriate and structured analysis. The student can evaluate, synthesise and express complex ideas proficiently, showing creativity, originality and insight. The student adds significantly to the learning environment of the classroom through reflection and response.

APPROACHES TO LEARNING

Level	CRITERIA
NG	This student fails to meet any of the criteria below.
E Very poor	This student is seriously under-achieving, and on no occasion works to his/her ability. Many required tasks remain incomplete, and the student fails to submit the majority of homework assignments. Class work is poorly presented and the student demonstrates no valuable commitment to improve. This student is late for class, and regularly fails to bring the correct materials to school. The student may also be uncooperative in dealings with his/her teachers, and may be a disruptive influence in class.
D Poor	This student is clearly under-achieving and rarely works to his/her ability, occasionally failing to meet the basic requirements set. This student only completes the majority of homework assignments, and works inconsistently in class. While this student demonstrates some willingness to improve, these demonstrations are infrequent. This student is not always punctual, and at times fails to bring the required materials to class. He/she will not always follow advice, may display inappropriate behaviour, and has a less-than-positive influence on the group.
C Satisfactory	The student has met all the requirements set by the teacher, but is probably under-achieving in some areas. Homework is always submitted, though s/he occasionally fails to meet a deadline. This student will be on time for class, though s/he may occasionally be less than fully prepared for study. This student may be willing to listen to advice, but will only occasionally act upon it. In most activities, s/he will be a positive member of the class.
B Good	This student works to the best of his/her ability for the majority of assignments. The student completes all homework assignments, and works consistently in class. S/he is punctual and, in general, well prepared for class. S/he is positive on most occasions, and ready to learn. This student listens to advice, though s/he does not always act upon it. The student is, in general, a positive influence on the class.
B+ Very good	This student works to the best of his/her ability in almost every activity. All assignments are completed on time. S/he is punctual and, almost without exception, eager to learn and well prepared for class. This student is ready to listen to advice, and is a supportive, positive member of his/her peer group.
A Excellent	This student completes all required tasks to the best of his/her ability, and has met all deadlines. S/he produces work in addition to that required on their own initiative, to support work which has been completed in class. S/he arrives to class on time, with the correct materials, and ready to learn. This student is ready to listen to advice, is a supportive member of the group, and is a positive role model for his/her peers.