International Baccalaureate (IB)
Diploma Program
Course Descriptions
2017-2018

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The International School of Florence
International Baccalaureate (IB) Diploma Programme Course Descriptions
2017/18

The International Baccalaureate (IB) Diploma Programme is a rigorous pre-university course of study, leading to examinations, that meets the needs of the highly motivated and academically inclined secondary school student. Designed as a comprehensive curriculum that allows its graduates to fulfill requirements of the various national systems of education, the IB is based on the pattern of no single country. It provides students of different linguistic, cultural, and educational backgrounds with the intellectual, social, and critical perspectives necessary for the adult world that lies ahead of them.

The IB Curriculum at ISF

Group 1
Language A (Studies in Language and Literature)
- English A: Language & Literature HL/SL
- English A: Literature HL/SL
- Italian A: Language & Literature HL/SL
- Italian A: Literature HL/SL

Group 2
Language Acquisition
- English B HL/SL
- Italian B HL/SL
- Italian ab initio SL

Group 3
Individuals and Societies
- Business Management HL/SL
- History HL/SL
- ITGS (may be offered as a Group 6 elective only) HL/SL

Group 4
Experimental Sciences
- Biology HL/SL
- Chemistry HL/SL
- Physics HL/SL

Group 5
Mathematics
- Mathematical Studies SL
- Mathematics Standard SL
- Mathematics Higher HL

Group 6
Arts and Electives
- Visual Arts HL/SL
- French B HL/SL
- Spanish B HL/SL
- Chemistry as a Second Science HL/SL

One subject from each of the above Groups must be chosen for the two years of the Diploma Programme. At least three and not more than four must be offered at Higher level (HL) and the others at Standard Level (SL). Before making a final decision on which classes to take, students must consult “Selecting Correct Classes for Specific University Programmes” at the end of this manual, as well as the IB Diploma Handbook. For those students pursuing only the ISF American High School Diploma and not the full IB Diploma, it should be noted that all 11th and 12th Grade classes are IB classes at ISF.

The school strives to satisfy as far as possible the requirements of its student body, which changes each year, but lack of numbers and other timetabling restrictions may further limit the proposed choices (including offering the HL version of a class) that are illustrated above.

In addition to completing the six subjects, each Diploma candidate must meet the following requirements (see the “Other IB Requirements” section for more detail):

Extended Essay
A substantial piece of independent work/research

Theory of Knowledge (ToK)
A course in the Theory of Knowledge

Creativity, Activity, and Service (CAS)
Activities that broadly cover the above mentioned areas
IB English A: Language and Literature

Aims

The English Language and Literature course aims to develop students' appreciation and use of the English language through the study of literature, as well as non-fiction texts. Students develop their reading, writing and speaking abilities in a variety of contexts, focusing in particular on the language of the texts they study to become aware of the role of each text's wider context in shaping its meaning. In addition to literature, the study of media and culture allows another approach to the way language shapes our lives, through the study of war reporting, censorship, media and democracies, advertising, and cultural stereotypes. The course is designed to be flexible - teachers have the opportunity to construct it in a way that reflects the interests and concerns that are relevant to their students while developing in students a range of transferable skills.

Course Outline

Class of 2018
Year One
George Orwell 1984 & Selected Essays
Sophocles Oedipus Rex
Selected Poetry

Year Two
Friedrich Durrenmatt The Visit
Athol Fugard Master Harold and the Boys
Langston Hughes Selected Poems
Tim O'Brien The Things They Carried

Class of 2019
Year One
Part 1 Language in cultural context
Part 4 Literature - critical study
Margaret Atwood A Handmaid’s Tale
William Shakespeare Much Ado About Nothing
Wislawa Szymborska Selected poetry

Year Two
Part 2 Language and mass communication
Part 3 Literature - texts and contexts
Jean Anouilh Antigone
George Bernard Shaw Pygmalion
Tennessee Williams A Streetcar named Desire

ISF Assessment

ISF Assessment is based on written responses, oral presentations, essays and commentary.

IB Assessment

The Language and Literature course includes an oral component (30%), two written tasks, which allow students to explore the written language in a creative context (20%), and a final exam, which is composed of a textual analysis on one or two unseen texts (25%) and an essay based on the course content (25%).

IB English A: Literature

Aims

The programme and assessment for English A: Literature are designed to meet the need of IB candidates for whom English is a major language. The main focus is the study of literature written in English as well as works from literature in translation. The course is a two-year programme offered at Higher and Standard levels. The aims of the programme are to:
--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 students’ powers of expression, both oral and written communication
--encourage students to recognize the importance of the contexts in which texts are written and received
--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.

**Course Outline**

**Part I (Works in Translation)**
- Pablo Neruda *20 Love Poems and A Song of Despair*
- Wislawa Szymborska *View with a Grain of Sand*
- Voltaire *Candide*

**Part II (Detailed Study)**
- Robert Frost *Selected Poems*
- William Shakespeare *As You Like It*
- David Foster Wallace *Consider the Lobster and Other Essays*

**Part III (The Novel)**
- Joseph Conrad *Heart of Darkness*
- Ernest Hemingway *The Sun Also Rises*
- Mark Twain *Huckleberry Finn*
- Evelyn Waugh *Handful of Dust*

**Part IV (Options)**
- Selected poetry
- Mary Shelley *Frankenstein*
- Kurt Vonnegut *Slaughterhouse Five*

**ISF Assessment**

Students’ assessment over the two years is based on:

- Discussions: participation in class discussions is strongly encouraged
- Written commentaries on unseen passages
- Oral and written commentaries on passages from the works studied in class
- Literary essays
- Creative presentations of a piece of work, often involving group work

All students’ work is assessed according to IB criteria descriptors.

**IB Assessment**

**Higher level:**
- i) External Assessment (70% of final grade)
  - Paper 1: Commentary (2 hours) (20%)
  - Paper 2: Essay based on Part III (2 hours) (25%)
  - Written Assignment (25% of final grade) based on Part I

- ii) Internal Assessment (30% of final grade)
  Based on:
  - Part II: Detailed Study: Individual oral commentary (15%)
  - Part IV: Options: Individual oral presentation (15%)

**Standard Level:**
- i) External Assessment (70% of final grade)
  - Paper 1: Commentary (1.5 hours) (20%)
  - Paper 2: Essay based on Part III (1.5 hours) (25%)
  - Written Assignment (25% of final grade) based on Part I

- ii) Internal Assessment (30% of final grade)
  Based on:
  - Part II: Detailed Study: Individual oral commentary (15%)
  - Part IV: Options: Individual oral presentation (15%)
Gli obiettivi del corso Italian A: Language and Literature sono:

1. Esporre gli studenti ad una ampia varietà di testi, diversi per genere e stile.
2. Sviluppare l’abilità di analisi dettagliata dei diversi testi e stabilire le loro possibili connessioni.
3. Sviluppare le capacità espressive sia della comunicazione orale che scritta.
4. Incoraggiare gli studenti a riconoscere l’importanza del contesto in cui i testi sono ambientati e scritti.
5. Incoraggiare, attraverso lo studio dei testi, ad apprezzare le differenti prospettive culturali che emergono dai contenuti.
6. Incoraggiare ad apprezzare la forma e lo stile testuale, espresso attraverso gli elementi della lingua.
7. Promuovere negli studenti una entusiastica e vivace curiosità culturale.
8. Sviluppare la consapevolezza di quanto lingua e cultura influenzino il contesto culturale ed il messaggio dei testi.
9. Incoraggiare gli studenti a un pensiero critico che consenta di esplorare le interazioni tra testi, messaggio e “audience”.

Il corso IB Italian A Language and Literature è articolato nei seguenti moduli:

Part 1. Lingua nel contesto culturale:
- Lingua e Potere
- Lingua e genere
- Storia ed evoluzione della lingua

Verranno discussi ed analizzati testi di vario genere e fonti in base a lingua, stile e contenuto, con la finalità di produrre Commenti scritti (Paper 1), Orali e Written Tasks.

Part 2. Lingua e mezzi di comunicazione di massa:
- Le diverse forme di di comunicazione nei Media (pubblicità, notiziari, blog)
- Potenziali influenze dei Media in politica (censura, propaganda, servizio pubblico)
- Uso della lingua e dell’immagine per informare, persuadere, intrattenere.

In questa parte verrà analizzato il modo in cui la lingua viene utilizzata dai Media per ottenere le molte diversità di obiettivi e messaggi, con la finalità di produrre sia Orali che Written Tasks.

Part 3. Literary Section:
- C. Goldoni La locandiera
- N. Ginzburg Ti ho sposato per allegria (solo HL)
- H. Ibsen Casa di bambola

I testi analizzati in questa parte del corso sono finalizzati alla produzione di Formal Comparative Essays (Paper 2).

Part 4. Literary Section:
- G. Bassani Il Giardino dei Finzi-Contini
- L. Pirandello Il fu Mattia Pascal
- G. Ungaretti Vita di un uomo

La parte 4 analizza tre opere su cui si basa il Formal Oral.

IB Assessment

External Assessment 70%:
- Paper 1 – Analisi del Testo 25%
- Paper 2 – Essay 25%
- Written Task 20%

Internal Assessment 30%:
- Orali di classe 15%
- Orale Formale 15%
Descrizione del corso

Questo è un corso di due anni che prepara gli studenti madrelingua al Diploma IB. All'interno del corso verranno affrontati quattro gruppi letterari, ciascuno dei quali ha lo scopo di sviluppare specifiche competenze linguistiche orali e scritte.

Obbiettivi

- Incoraggiare l’apprezzamento della letteratura e sviluppare la comprensione delle tecniche della critica letteraria
- Sviluppare la capacità espressiva degli studenti nella comunicazione, sia scritta che orale.
- Introdurre gli studenti ad una gamma di lavori letterari di vari periodi, generi, stili e contesti
- Ampliare la prospettiva degli studenti attraverso lo studio di lavori da altre culture e lingue.
- Incoraggiare gli studenti a apprezzare la qualità formale, stilistica ed estetica di un testo.
- Incoraggiare gli studenti a riconoscere l'importanza del contesto in cui i testi sono stati scritti.
- Promuovere negli studenti il piacere e l’interesse duraturo per la letteratura

Course Outline

Part I (Works in Translation)
Michael Bulgakov Il maestro e Margherita
Gabriel Garcia Marquez Cronaca di una morte annunciata (solo HL)
Tennessee Williams Un tram che si chiama Desiderio

Part II (Detailed Study)
Carlo Goldoni La Locandiera
Giacomo Leopardi Le Operette morali (solo HL)
Eugenio Montale Ossi di seppia/ Le Occasioni

Part III (The Novel)
Giorgio Bassani Il giardino dei Finzi-Contini
Luigi Pirandello Il fu Mattia Pascal
Lalla Romano Una giovinezza inventata (solo HL)
Leonardo Sciascia Il giorno della civetta

Part IV (Literature and film)
G. Tomasi di Lampedusa Il Gattopardo
F. S. Fitzgerald Il grande Gatsby
Autori Vari Selezione di poesie

ISF Assessment

La valutazione degli studenti durante i due anni si basa su:

- Discussioni: viene fortemente incoraggiata la partecipazione in discussioni di classe
- Commenti scritti su passi non previamente conosciuti
- Commenti orali e scritti su passaggi estratti da opere studiate in classe
- Saggi letterari
- Presentazioni creative su opere letterarie, che possono richiedere lavoro di gruppo

Tutto il lavoro degli studenti viene valutato seguendo i descrittori dei criteri di valutazione IB.

IB Assessment

Higher level:
i) Valutazione Esterna (70% del voto totale)
   Paper 1: Commento (2 ore) (20%)
   Paper 2: Saggio basato sul Gruppo III (2 ore) (25%)
   Written Assignment (25% del voto totale)

ii) Valutazione Interna (30% del voto totale)
   Si basa su opere del:
   Gruppo II: Detailed Study: Individual oral commentary (15%)
   Gruppo IV: Literature and film: Individual oral presentation (15%)

Standard Level:

i) Valutazione Esterna (70% del voto totale)
   Paper 1: Commento (1.5 ore) (20%)
   Paper 2: Saggio basato sul Gruppo III (1.5 ore) (25%)
Written Assignment (25% del voto totale)

ii) Valutazione Interna (30% del voto totale)
Si basa su opere del:
Gruppo II: Detailed Study: Individual oral commentary (15%)
Gruppo IV: Literature and film: Individual oral presentation (15%)

GROUP 2 – LANGUAGE ACQUISITION

IB English B/Italian B/French B/Spanish B

(Please note that French B and Spanish B are scheduled and offered as Group 6, or Elective, classes at ISF.)

Aims

Students in Language B will be able to:

1. communicate clearly and effectively in a range of situations, demonstrating linguistic competence and intercultural understanding
2. use language appropriate to a range of interpersonal and/or cultural contexts
3. understand and use language to express and respond to a range of ideas with accuracy and fluency
4. organize ideas on a range of topics, in a clear, coherent and convincing manner
5. understand, analyze and respond to a range of written and spoken texts
6. understand and use works of literature written in the target language of study (HL only)

Course Outline

SL and HL are differentiated by the depth of syllabus coverage, the study of literature at HL, and the level of difficulty and demands of assessment and assessment criteria.

The core—with topics common to both levels—is divided into three areas and is a required area of study:

- Communication and media
- Global issues
- Social relationships

In addition, at both SL and HL, teachers select two from the following five options.

- Cultural diversity
- Customs and traditions
- Health
- Leisure
- Science and technology

Also, at HL, students read two works of literature on which the Written Assignment is based:

In English B:
11th Grade:
- Anne Fine *Flour Babies*
- Morton Rhue *The Wave*

12th Grade:
- Mark Haddon *The Curious Incident of the Dog in the Night-Time*
- Anne Fine *Flour Babies*


In French B:
- Albert Camus *L’étranger*
- Eric-Emmanuel Schmitt *Mr Ibrahim et les Fleurs du Coran*

In Italian B:
- Niccoló Ammaniti *Anna*
- Alessandro d’Avenia *Bianca come il latte rossa come il sangue*

In Spanish B:
- Gabriel García Marquez *Crónica de una muerte anunciada*
- Laura Esquivel *Como agua para chocolate*
ISF Assessment

Students’ assessment over the two years is based on:

- Written production (essays, compositions, dialogues, etc.)
- Oral presentations
- Role play
- Dossier, mainly students’ work
- Vocabulary tests
- Newspaper reports
- Projects based on publicity
- Grammar tests

All activities are given the same importance and bear the same weight in terms of final grade on report card. The students’ work is assessed according to IB criteria descriptors.

IB Assessment

Higher Level

External assessment (70%)

Paper 1 (1 hour 30 minutes): Receptive skills 25%
Text-handling exercises on five written texts, based on the core.

Paper 2 (1 hour 30 minutes): Written productive skills 25%
Two compulsory writing exercises.
Section A: One task of 250–400 words, based on the options, to be selected from a choice of five.
Section B: Response of 150–250 words to a stimulus text, based on the core.

Written assignment: Receptive and written productive skills 20%
Creative writing of 500–600 words plus a 150-word rationale, based on one of the literary texts read.

Internal assessment (30%) (Internally assessed by the teacher and externally moderated by the IB.)

Individual oral (8–10 minutes) 20%
Based on the options: 15 minutes’ preparation time and a 10-minute (maximum) presentation and discussion with the teacher.

Interactive oral activity 10%
Based on the core: Three classroom activities assessed by the teacher.

Standard Level

External assessment (70%)

Paper 1 (1 hour 30 minutes): Receptive skills 25%
Text-handling exercises on four written texts, based on the core.

Paper 2 (1 hour 30 minutes): Written productive skills 25%
One writing exercise of 250–400 words from a choice of five, based on the options.

Written assignment: Receptive and written productive skills 20%
Inter-textual reading followed by a written exercise of 300–400 words plus a 100-word rationale, based on the core.

Internal assessment (30%) (Internally assessed by the teacher and externally moderated by the IB.)

Individual oral (8–10 minutes) 20%
Based on the options: 15 minutes’ preparation time and a 10-minute (maximum) presentation and discussion with the teacher.

Interactive oral activity 10%
Based on the core: Three classroom activities assessed by the teacher.
The ab initio programme is aimed at students that have had no previous experience of learning the target language and is available as a Standard Level (SL) course only. It must be studied over two years.

**Aims**

The aims of the ab initio programme are to:

- develop students’ ability to communicate in speech and in writing in order to enable them to deal adequately with familiar and practical needs
- introduce students to the culture of the country or the countries where the language is spoken through the study of the target language
- provide students with a foundation for the further study of the target language
- provide enjoyment and intellectual stimulation
- encourage positive attitudes to the learning of the other languages and to their speakers and countries

**Objectives**

Candidates should be able to:

- understand and respond appropriately to the spoken language (for example, in announcements, instructions, requests, in the form of monologues or dialogues)
- engage in conversation in order to deal with everyday situations
- understand short written passages on the defined topics; recognize essential notices (for example, signs, menus, timetables, advertisements) and to be able to extract specific information from texts such as brochures, guides, letters
- carry out writing tasks such as short messages (for example, postcards, lists, notes); a letter; instructions; short compositions
- show an awareness of the culture of the target language
- compare the target culture with the own culture and be able to understand the differences

**Course Outline**

The language ab initio course is organized into three themes:

- Individual and society
- Leisure and work
- Urban and rural environment

Each theme has a list of topics that provide the students with opportunities to practice and explore the language, as well as to develop intercultural understanding.

The programme develops and assesses the following skills:

- Text - handling
- Written production
- Oral Listening

The course will use a variety of written, visual and audio materials. Everyday exposure to Italian is encouraged outside the classroom.

Text used: For the first year: *Dimmi*, published by Guerra. During the second year only “real-world” texts in Italian are used.

**ISF Assessment**

The trimester grades will be based on tests and activities that are assessed using the IB scheme of assessment.

**IB Assessment**

The IB external assessment covers 75% of the final mark and consists of two written papers and a written assignment:

- Paper 1: 1.5 hours
- Paper 2: 1 hour
- Written Assignment: 2 hours

The IB internal assessment is worth 25% of the final mark and consists of an oral exam that is recorded and externally moderated.
The aims of the IB Business Management programme are to:

- Demonstrate knowledge and understanding of business terminology, concepts and principles.
- Promote the importance of exploring business issues from different cultural perspectives, identify social and cultural factors, and ethical considerations, in the actions of organizations.
- Assess the impact of the actions of organizations on the internal and external environment, thus encouraging a holistic view of the world of business.
- Enable the student to appreciate the pace, nature and significance of change.
- Demonstrate competence in problem solving by identifying the problem, collecting, selecting, assessing and interpreting data using appropriate analytical tools, and recommending solutions by evaluating their quantitative and qualitative implications.
- Demonstrate their ability to apply theory to real-life situations, evaluate information in order to distinguish between fact and opinion, think critically and make decisions.

**Course Outline**

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<thead>
<tr>
<th>Higher Level</th>
<th>Standard Level</th>
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<tbody>
<tr>
<td>1. Business Organizations and the External Environment</td>
<td>1. Introduction to Organizations and the External Environment</td>
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<td>2. Human Resources</td>
<td>2. Human Resources</td>
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<tr>
<td>3. Accounts and Finance</td>
<td>3. Accounts and Finance</td>
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<tr>
<td>5. Operations management</td>
<td>5. Operations management</td>
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<tr>
<td>6. Business Strategy</td>
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Textbooks:

**Business Studies** 3rd Edition, Hoang P.
BusinessStudiesOnline

**ISF Assessment**

Students will be assessed on a range of in-class and homework tasks, comprising case studies, business reports, presentations, tests and exams.

**IB Assessment**

**Higher Level**
- Paper 1: 40%
- Paper 2: 35%
- Internal Assessment research project: 25%

**Standard Level**
- Paper 1: 40%
- Paper 2: 35%
- Internal Assessment research project: 25%
Aims

The aims of the IB History programme are to promote:

- The acquisition and understanding of historical knowledge in breadth and in depth, and across different cultures
- A developing appreciation and understanding of history as a discipline, including the nature and diversity of its sources, methods and interpretations
- International awareness and understanding by promoting the achievement of empathy with, and understanding of people living in diverse places and at different times
- A better understanding of the present through an understanding of the past
- An appreciation of the historical dimension of the human condition
- An ability to use and communicate historical knowledge and understanding
- A lasting interest in history

Course Outline

Content for the two year course will be selected from among the following topics:

**Standard Level and Higher Level**

Historical Investigation: this is an individual project that is the internally assessed part of the IB grade, worth 20% for HL students and 25% for SL students. Students will work by themselves on a topic of their own choosing, both in class and out of class, formulating a historical question, doing research, evaluating sources, analyzing evidence and drawing conclusions.

**Paper 1 (Prescribed Subject)**

Rights and Protest
Two case studies, each from a different region: USA and South Africa.

**Paper 2 (World History Topics)**

Independence movements (1800-2000)
- Bolivar and Gran Columbia
- Gandhi and India
- Ho Chi Minh and Vietnam
- De Valera and Ireland.

Authoritarian States (20th century)
- Nasser and Egypt
- Castro and Cuba
- Mao and China
- Hitler and Germany

**Higher Level only**

**Paper 3**

Depth Studies of History of Africa and the Middle East.

Skills and concepts:
Emphasis will be placed on the concepts of similarity and difference, cause and consequence, change and continuity, and empathy, and the skills of essay writing (formulating a clear argument based on evidence) and use and evaluation of historical sources.

Exam practice: use and evaluation of historical sources, and test essays written under timed conditions.

**Textbooks**

Gray, B. **Authoritarian States**
Habibi, M. **History of Europe and the Middle East**
Rogers, M. **Rights and Protest**

**ISF Assessment**

Students will be assessed on source evaluation exercises, essay writing (in class, and for homework), presentations, end-of-year exam (IBDP 1) and the mock exams (IBDP 2).
IB Assessment

**Standard Level**
Paper 1 (use and evaluation of sources) 30%
Paper 2 (two essays on World History) 45%
Historical investigation 25%

**Higher Level**
Paper 1 (use and evaluation of sources) 20%
Paper 2 (two essays on World History) 25%
Paper 3 (three essays on History of Africa and the Middle East) 35%
Historical investigation 20%

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**Information Technology in a Global Society (ITGS)**

(please note that ITGS is most often scheduled and offered as a Group 6, or Elective, class, depending on interest)

**Aims**
The aims of the Information Technology in a Global Society (ITGS) course at SL and HL are to:

- enable the student to evaluate social and ethical considerations arising from the widespread use of IT by individuals, families, communities, organizations and societies at the local and global level.
- develop the student’s understanding of the capabilities of current and emerging IT systems and to evaluate their impact on a range of stakeholders.
- enable students to apply their knowledge of existing IT systems to various scenarios and to make informed judgments about the effects of IT developments on them.
- encourage students to use their knowledge of IT systems and practical IT skills to justify IT solutions for a specified client or end-user.

**Course Outline**
At either level (SL or HL) the ITGS course consists of three compulsory interconnected strands that reflect the integrated nature of the course.

- **Strand 1: Social and ethical significance**
- **Strand 2: Application to specified scenarios**
- **Strand 3: IT systems**

**Strand 1: Social and ethical significance**

**SL/HL core**
Social and ethical considerations linked to specified IT developments.
Students must study the following 12 issues.
1.1 Reliability and integrity
1.2 Security
1.3 Privacy and anonymity
1.4 Intellectual property
1.5 Authenticity
1.6 The digital divide and equality of access
1.7 Surveillance
1.8 Globalization and cultural diversity
1.9 Policies
1.10 Standards and protocols
1.11 People and machines
1.12 Digital citizenship

**HL extension**
Social and ethical considerations linked to the two HL extension topics and the issues raised by the annually issued case study.

**Strand 2: Application to specified scenarios**

**SL/HL core**
Scenarios based on real-life situations must be used when addressing specified IT developments.

Students must study the following 6 themes.
2.1 Business and employment
2.2 Education and training
2.3 Environment
2.4 Health
2.5 Home and leisure
2.6 Politics and government

HL extension
Scenarios based on real-life situations must be used when addressing specified IT developments in the two HL extension topics and the annually issued case study.

Strand 3: IT systems

SL/HL core
The terminology, concepts and tools relating to specified IT developments.

Students must study the following 9 topics.
3.1 Hardware
3.2 Software
3.3 Networks
3.4 Internet
3.5 Personal and public communications
3.6 Multimedia/digital media
3.7 Databases
3.8 Spreadsheets, modelling and simulations
3.9 Introduction to project management

HL extension
Students must study the following topics.
3.10 IT systems in organizations
3.11 Robotics, artificial intelligence and expert systems
3.12 Information systems specific to the annually issued case study

The project (practical application of IT skills)
The application of skills and knowledge to develop an original IT product for a specified client.

Textbook: Information Technology in a Global Society by Stuart Gray

ISF Assessment
ISF student assessment is based on (for report card grades):
- Chapter tests
- Past questions
- Exam – end of year
- Project
- In-class presentations

IB Assessment Outline

External assessment (3 hours) (70%)
Paper 1 (1 hour 45 minutes) (40%)
Five structured questions that assess in an integrated way the three strands of the syllabus. Social and ethical significance; Application to specific scenarios; IT systems (60 marks)

Paper 2 (1 hour 15 minutes) This paper consists of one unseen article. (30%)
Students are required to write a response to this article. (26 marks)

Internal assessment (30%)
This component is internally assessed by the teacher and externally moderated by the IB at the end of the course.

Project (30 hours)
The development of an original IT product for a specified client. Students must produce:
- a cover page using prescribed format
- an original IT product
- documentation supporting the product (word limit 2,000 words). (30 marks)
Aims
Through studying Biology, Chemistry, or Physics, students should become aware of how scientists work and communicate with each other. While the scientific method may take on a wide variety of forms, it is the emphasis on a practical approach through experimental work that characterizes these subjects.

The aims enable students, through the overarching theme of the Nature of science, to:

1. appreciate scientific study and creativity within a global context through stimulating and challenging opportunities
2. acquire a body of knowledge, methods and techniques that characterize science and technology
3. apply and use a body of knowledge, methods and techniques that characterize science and technology
4. develop an ability to analyse, evaluate and synthesize scientific information
5. develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
6. develop experimental and investigative scientific skills including the use of current technologies
7. develop and apply 21st-century communication skills in the study of science
8. become critically aware, as global citizens, of the ethical implications of using science and technology
9. develop an appreciation of the possibilities and limitations of science and technology
10. develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.

Objectives
The assessment objectives for Biology, Chemistry, and Physics reflect those parts of the aims that will be formally assessed either internally or externally. These assessments will centre upon the nature of science. It is the intention of these courses that students are able to fulfill the following assessment objectives:

1. Demonstrate knowledge and understanding of:
   a. facts, concepts and terminology
   b. methodologies and techniques
   c. communicating scientific information.
2. Apply:
   a. facts, concepts and terminology
   b. methodologies and techniques
   c. methods of communicating scientific information.
3. Formulate, analyse and evaluate:
   a. hypotheses, research questions and predictions
   b. methodologies and techniques
   c. primary and secondary data
   d. scientific explanations.
4. Demonstrate the appropriate research, experimental, and personal skills necessary to carry out insightful and ethical investigations.

Difference between HL and SL in all Group 4 Courses
While the skills and activities of group 4 science subjects are common to students at both SL and HL, students at HL are required to study some topics in greater depth, in the additional higher level (AHL) material and in the common options. The distinction between SL and HL is one of breadth and depth.

IB Assessment in all Group 4 Courses

Standard Level
Paper 1
Duration: 45 minutes; Weighting: 20%; Marks: 30
Paper 2
Duration: 1 hour 15 minutes; Weighting: 40%; Marks: 50
Paper 3
Duration: 1 hour; Weighting: 20%; Marks: 35

Higher Level
Paper 1
Duration: 1 hour; Weighting: 20%; Marks: 40
Paper 2
Duration: 2 hours 15 minutes; Weighting: 36%; Marks: 95
Paper 3
Duration: 1 hour 15 minutes; Weighting: 24%; Marks: 45
All students will do an individual investigation that will account for 20% of their overall grade. This is often referred to as the Internal Assessment component. All students must also take part in a group project referred to as the Group 4 project.

**ISF Assessment in all Group 4 Courses**

This will be based on a combination of tests and practical assessments. The proportion of each will vary according to the stage of the course and the content being covered.

By its very nature, Biology lends itself to an experimental approach; this will be reflected throughout the course. Students will also be expected to do a variety of tasks at home using their textbook and Internet resources.

**Course Content**

All students will study the Core and one Option; HL students will study the AHL material as well.

**Core**
1. Cell biology
2. Molecular biology
3. Genetics
4. Ecology
5. Evolution and biodiversity
6. Human physiology

**Additional higher level (AHL)**
1. Nucleic acids
2. Metabolism, cellular respiration, and photosynthesis
3. Plant biology
4. Genetics and evolution
5. Animal physiology

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

The IB Chemistry course aims to develop an understanding of the natural world by focusing on reactions, materials and processes. Since Chemistry is an experimental science, teaching is supplemented with practical investigative work, interactive web simulations, demonstrations, an interdisciplinary science project, and use of spreadsheet programs, all culminating in a personal individual investigation.

**Course Content**

All students will study the Core and the Option C, Energy; HL students will study the AHL material as well.

**Core**
1. Stoichiometric relationships
2. Atomic structure
3. Periodicity
4. Chemical bonding and structure
5. Energetics/thermochemistry
6. Chemical kinetics
7. Equilibrium
8. Acids and bases
9. Redox processes
10. Organic chemistry
11. Measurement and data processing (analysis)

**Additional higher level (AHL)**

Core topics 2 – 11 are studied with more depth and breadth.

**Option**
C. Energy
IB Physics

By its very nature, Physics lends itself to an experimental approach; this will be reflected throughout the course. Students will also be expected to do a variety of tasks at home using their textbook and Internet resources. Text: Higher Level Physics 2nd edition, Hamper, Pearson 2014; access to an etext version is included.

Course Content

All students will study the Core and one Option; HL students will study the AHL material as well.

Core
1. Measurements and uncertainties
2. Mechanics
3. Thermal physics
4. Waves
5. Electricity and magnetism
6. Circular motion and gravitation
7. Atomic, nuclear and particle physics
8. Energy production

Additional higher level (AHL)
9. Wave phenomena
10. Fields
11. Electromagnetic induction
12. Quantum and nuclear physics

Option
D. Astrophysics

GROUP 5 – MATHEMATICS

ALL STUDENTS REQUIRE A GRAPHICAL DISPLAY CALCULATOR (TI-84 has the minimum requirements).

Aims
(for all IB mathematics courses)

The aims of all IB mathematics courses are 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 subject.
• 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 generalization.
• 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.

IB Mathematical Studies SL

Course Outline

A two-year course which involves the study of:

Number and algebra
Logic, sets and Probability
Geometry and trigonometry
Introductory differential calculus
Descriptive statistics
Statistical applications
Mathematical models

The graphical calculator TI-84 Plus is used and is an integral part of this course.

There is a major mathematics project required. It is usually completed by the end of the first year.

ISF Assessment

This tries to reflect the IB scheme with tests using the IB assessing criteria and small projects. The combined mark is then converted to a grade from 1 - 7 based on the current IB scale. There is an exam at the end of the year that accounts for 25% of the year mark in 11th grade and a mock exam in 12th grade that also counts 25% of the year grade.

IB Assessment

The project accounts for 20% of the final mark and is externally moderated. The project is marked on the following categories: statement of the task, data collection, analysis, evaluation, structure and communication, notation, and terminology.

• Paper 1, short response questions 40% 1.5 hours
• Paper 2, extended-response questions 40% 1.5 hours

IB Mathematics Standard Level

Course Outline

IB Mathematics Standard Level students will study the following topics:

• Numbers and Algebra
• Functions and Equations
• Circular Functions and Trigonometry
• Transformations
• Calculus: differential and integral calculus and its applications


ISF Assessment

Student assessment will be based on:

• A Mathematical Investigations.
• Chapter tests
• Homework assignments
• Final exam

IB Assessment

The external assessment accounts for 80% of the grade.

• Paper 1 (No calculator allowed) 1 hr 30 min 40%
  Section A 20%
  Compulsory short-response questions based on the whole syllabus
  Section B 20%
  Compulsory extended-response questions based on the whole syllabus

• Paper 2 (Graphic display calculator (GDC) required) 1 hr 30 min 40%
  Section A 20%
  Compulsory short-response questions based on the whole syllabus
  Section B 20%
  Compulsory extended-response questions based on the whole syllabus

The internal assessment accounts for 20% of the grade.

• Mathematical Exploration

Internal assessment in mathematics SL is an individual exploration. This is a piece of written work that involves investigating an area of mathematics. The exploration is internally assessed by the teacher and externally moderated by the IBO.

IB Mathematics Higher Level

Course Outline

IB Mathematics Higher Level students will study the following topics:

• Numbers and Algebra including Complex Numbers
• Functions and Equations
• Circular Functions and Trigonometry
• Vectors
• Statistics
• Probability
• Calculus: differential and integral calculus and its applications
• One optional topic selected from:
  • Statistics and Probability
  • Sets, Relations and Groups
  • Calculus
  • Discrete Mathematics


**ISF Assessment**

Student assessment over the two years will be based on:
• A Mathematical investigation
• Chapter tests and quizzes
• Homework assignments
• Final exam

**IB Assessment**

The internally assessed component in this course is a mathematical exploration. This is a short report written by the student based on a topic chosen by him or her, and it should focus on the mathematics of that particular area. The exploration is internally assessed by the teacher and externally moderated by the IBO and accounts for 20% of the final mark.

• Paper 1, short and extended response questions on the core of the syllabus, calculators not permitted 30% 2hours
• Paper 2, short and extended response questions on the core of the syllabus, calculators permitted 30% 2hours
• Paper 3, short and extended-response questions on the optional topic, calculators permitted 20% 1hour

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**GROUP 6 – ARTS AND ELECTIVES**

**IB Visual Arts**

**Aims**

IB Visual Arts is a two-year course at both standard and higher level that aims to prepare the students in the following way:

• Enjoy lifelong engagement with the arts
• Become informed, reflective and critical practitioners in the arts
• Understand the dynamic and changing nature of the arts
• Explore and value the diversity of the arts across time, place and cultures
• Express ideas with confidence and competence
• Develop perceptual and analytical skills.

**Course Outline**

• Visually communicate ideas through the exploration and development of appropriate skills and media
• Respond visually and creatively to personal and cultural experiences
• Use visual literacy to explore the visual arts within diverse cultural contexts
• Develop the ability to articulate the meanings and messages communicated in images and objects
• Develop visual thinking.
• Investigating/exploring, reflecting, responding/communicating/creating.

**ISF Assessment**

Assessment is based on mid trimester and end of trimester portfolio reviews, in class critiques, and Visual Art Journal evaluation according to IB descriptors.

**IB Assessment**

1. A comparative study: 20% of the final grade - Externally Assessed
Students will compare and contrast the work of (at least 2) different artists, different techniques for making art
and theory behind the work (HL students will also include a reflection of how this relates to their own work). SL: 9-18 screens/pages; HL: 13-18 submitted (Personal reflection to artwork 3-5 slides) in a PDF format.

2. A process portfolio: 40% of the final grade - Externally Assessed
This is a documentation of the students’ journey of art-making, their engagement with different media, techniques, and processes involved in making their own body of works. (Completed works, works in progress, experiments, process and investigations). SL: 9-18 pages using two different media types/screens submitted; HL: 13-25 pages using three different media types/screens submitted in a PDF format.

3. An exhibition with a written rationale: 40% of the final grade - Internally Assessed by Teacher
Students reflect on changes made during the process of creation and provide a rationale for the decisions regarding the selection of certain pieces for exhibition (These works are not included in the Process Portfolio). SL: 4-7 pieces with reflective commentaries; HL: 8-11 pieces with reflective commentaries and a PDF documenting the final artworks, exhibition and text.

OTHER IB REQUIREMENTS

Theory of Knowledge (ToK)

Aims

Theory of Knowledge provides students with an awareness and an understanding of their own beliefs, an analysis of how beliefs and knowledge are acquired, and the stimulus to be open-minded to accepting the beliefs of others. A significant aim of the course is to explore the means by which knowledge is gained: perception, language, reason, emotion, faith, imagination, intuition, and memory. The course also attempts to classify knowledge into subject areas: arts, ethics, mathematics, natural sciences, human sciences, indigenous knowledge, religious knowledge, and history. The special characteristics and constraints of these areas of knowledge, and the approaches employed in each, are compared and contrasted. In this way, Theory of Knowledge serves as a framework for the various elements of the IB Diploma Programme. In addition, a strong emphasis is placed on each student’s development of him- or herself as a “knower;” the focus here is on the knower’s relationship with the facts, events, and processes that comprise the outside world.

By the end of the course students should be able to:
• develop judgment based on gathered information;
• compare and contrast knowledge claims across the various subject areas;
• recognize where their beliefs come from;
• acknowledge the necessity of justifying their beliefs;
• develop a unification of their knowledge so that they are able to reflect on their acquired knowledge and put into perspective what they already know.

Course Outline

In achieving these goals, Theory of Knowledge largely makes use of the body of knowledge that students have accumulated and are still accumulating in their previous and current school courses. In addition, many of the topics for class discussions come from short newspaper and magazine articles culled from recent editions of sources such as The New York Times and The Economist. Videos and films (e.g. The Pianist) are also used. The range of additional sources used depends to a great degree on the interests of the students. Sources used in the past have included Bacon, Chomsky, Pinker, Carr, Ramachandran, Wiesel, Sagan, Warhol, the Dalai Lama, and Quinn. Guest speakers from the local community are occasionally invited to class to discuss different problems and questions with the students. The course also makes use of the Oxford IB Skills and Practice textbook Theory of Knowledge by J. Rutherford et al. to provide grounding and additional structure for the course.

A particularly attractive feature of Theory of Knowledge at ISF is the inclusion of a field trip to Munich and Dachau in the first trimester of grade 11. This trip brings students face-to-face with specific questions in ethics, history, and the arts, and it serves to supplement their conventional classroom learning with a more visceral educational experience.

ISF Assessment

Throughout the course, which runs from September of grade 11 to March of grade 12, ToK students are assessed in a variety of ways:
• essays based on assigned readings, class discussions, and/or outside research;
• oral presentations approved by the instructors;
• essays on prescribed titles.
**IB Assessment**

During the final months of the course students complete two assignments that together determine their IBDP Theory of Knowledge grade.

**External Assessment** (67%)

Written essay of 1200-1600 words on a prescribed title.

**Internal assessment** (33%)

Oral presentation of 10-15 minutes on a topic of the student’s choosing.

**CAS**

**Creativity, Activity, and Service (CAS)**

CAS is an exciting Program at the core of the International Baccalaureate Diploma Program! Participation in **Creativity**, in **Activity**, and in **Service** encourages students to share their energy and special talents while developing awareness, concern and the ability to work cooperatively with others. Students are encouraged to initiate their own projects individually or collectively with their fellow students. CAS is holistic and many activities and projects overlap between creativity, activity and service. The CAS program will challenge students, help them to acquire new skills and interests, develop a spirit of discovery and self-reliance, and foster awareness of themselves and of others. The IB aims for balance; students are asked not just to serve others but to nurture themselves as well as follow their passion for art and music, develop new skills in sports, and explore their personal boundaries.

CAS will inspire students to:
- Actively discover their passion by exploring a range of new CAS experiences
- Set goals and strive for excellence
- Learn and work collaboratively
- Increase self-awareness through reflection
- Improve the world around them through local and international service projects
- Understand the links between CAS and their subjects

Student completion of CAS is based on the achievement of the seven CAS learning outcomes realized through the student’s commitment of his or her CAS program over a period of 18 months. Students will have:

1. Identified own strengths and develop areas for growth.
2. Demonstrated that challenges have been undertaken, developing new skills in the process.
3. Demonstrated how to initiate and plan a CAS experience.
4. Shown commitment to and perseverance in CAS experiences.
5. Demonstrated the skills and recognize the benefits of working collaboratively.
6. Demonstrated engagement with issues of global significance.
7. Recognized and consider the ethics of choices and actions.

(Information is taken from the Creativity, Activity, Service guide for students graduating in 2017 and thereafter, published March 2015, International Baccalaureate Organisation.)

**Extended Essay (EE)**

The Extended Essay is a substantial piece of independent work of no more than 4,000 words in an area that interests the student and in one of the subjects of the IB curriculum. The student works under the supervision of a teacher at school and submits an Extended Essay, which meets general and subject-specific criteria. Generally speaking, the Extended Essay is started in February of the 11th Grade and is completed by November of the 12th Grade.
Selecting Correct Classes for Specific University Programmes

In Grade 10 students need to make informed choices about their future IB subjects as this can have a direct effect on the choice of university/college degree programme. This is even more important if students are choosing to go to university in the UK. It is strongly advised, therefore, to research several universities to check their general entrance requirements for specific subjects.

Students can check with the College Counselor, Mr. McIvor, for degree course descriptions and entrance requirements and students can also check the site http://www.ucas.com for exact requirements at specific universities in the UK.

Those classes listed below are generally requirements for UK universities and are also highly recommended for the USA. For instance, although a student may be accepted for a pre-med course in the USA without Chemistry, it gives the student far more chance of acceptance if he has taken Chemistry at least at SL.

For the rest of the world, including France, Germany, and Italy, the universities tend to be autonomous and parents/students need to check specific IB requirements by contacting the universities directly.

In any event, the courses and classes listed below are a guide only – students and parents are strongly advised to check with the universities/colleges of their choice to confirm admission requirements.

<table>
<thead>
<tr>
<th>GENERAL RULE</th>
<th>If you wish to take a subject you are studying at school at university level, you should take that subject at HL.</th>
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</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>Art and/or Math and/or Physics at HL (please check with individual universities)</td>
</tr>
<tr>
<td>Bio-Technology/Engineering</td>
<td>Biology HL and another science at HL; usually Math at SL</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>Usually require Chemistry at HL with Math or Physics at HL</td>
</tr>
<tr>
<td>Economics</td>
<td>Many require Math at HL such as LSE/UCL/Warwick; others will accept Math SL but not Math Studies</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>At least one Science at HL, usually Chemistry</td>
</tr>
<tr>
<td>Law/Politics/Philosophy</td>
<td>English A HL and/or History HL advisable</td>
</tr>
<tr>
<td>Mechanical/Electrical/Aeronautical/Automobile Engineering</td>
<td>Math and Physics at HL and will usually require a 5 in English A SL</td>
</tr>
<tr>
<td>Medicine/Dentistry</td>
<td>Chemistry HL and another Science at HL, usually Biology; Math at SL</td>
</tr>
<tr>
<td>Modern Languages (French, Italian, Spanish)</td>
<td>Usually require Language B HL if you want to study that specific language at university</td>
</tr>
<tr>
<td>New language (Arabic, Russian, Greek, Japanese, Mandarin)</td>
<td>Check with the university but usually require a Modern Language at HL</td>
</tr>
<tr>
<td>Physiotherapy/Nursing</td>
<td>Usually require Biology at HL with some universities also needing Chemistry at SL</td>
</tr>
<tr>
<td>PPE (Philosophy, Politics, Economics)</td>
<td>English A HL and/or History HL advisable; usually at least Math SL required</td>
</tr>
<tr>
<td>Psychology</td>
<td>Usually require Biology or Chemistry at HL (but some schools favor Chemistry) and Math at SL (some will accept Math Studies)</td>
</tr>
<tr>
<td>Veterinary Science</td>
<td>Biology and Chemistry at HL; some need Math at HL</td>
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