



India International School in Japan



IB Diploma Programme 2021-2023





Contents

Focus	Page
Cover Page	1
Table of Contents	2
Introduction	3
IBO Mission Statement	3
IB DP Programme Model	4
IB Diploma Programme Requirements	4
IB Diploma Subject Options at IISJ 2021-2023	6
IB Subject Options Form 2021-2023	7
IISJ IB Programme Fee Structure	8
Student Timetable	9
Assessment in the IB DP Programme	9
Assessment criteria in IB Diploma	10
Eligibility criteria for IB Diploma certificate	11
IISJ Subject Outlines 2021-2023	12
Group 1: English A Language and Literature HL	12
Group 2: English B, Japanese B, French B HL/SL	16
Group 3: Psychology HL/SL	19
Business Management HL/SL	22
Group 4: Biology HL/SL	27
Physics HL/SL	30
Chemistry HL/SL	33
Computer Science HL/SL	36
Group 5: Mathematics HL/SL	40
Group 6: Electives and Pathways	45
Mandatory IB Core Courses	46



INTRODUCTION

The International Baccalaureate Organization (IBO) offers high quality programme throughout the schools in the world. The IB diploma program is well appreciated program suitable for students entering to top universities around the globe. IB DP is a challenging and balanced academic program suitable for successful university education. It is targeted towards 16-19 years old students and being offered as a 2-year pre-university course. There are more than 700,000 thousand IB students in 140 countries all over the world.

IB MISSION STATEMENT

“The International Baccalaureate aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.”

IB diploma program aims to develop internationally minded people who, recognizing their common humanity and shared guardianship of the planet help to create a better and more peaceful world. The IB learners strive to be:

Inquirers

Knowledgeable

Thinkers

Communicators

Principled

Open-minded

Caring

Risk-takers

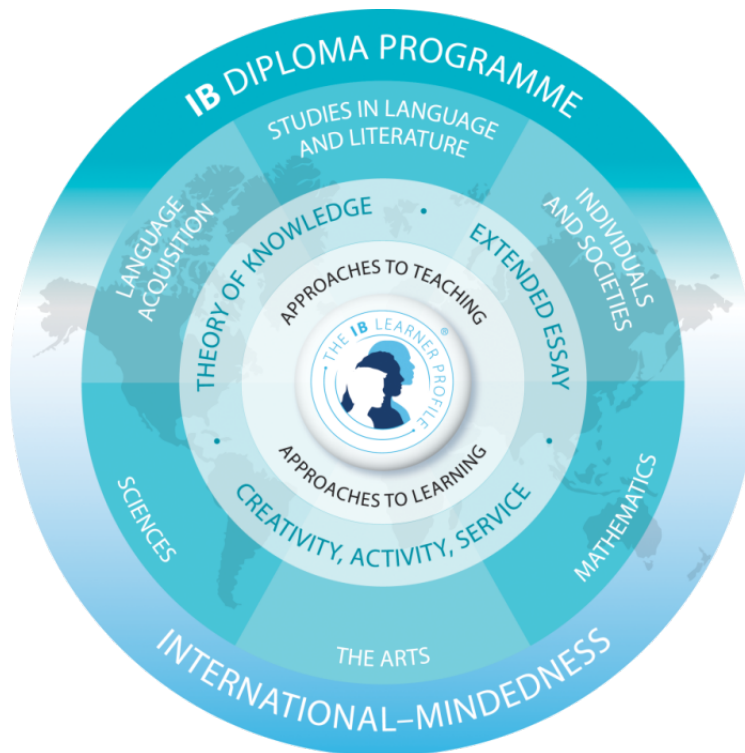
Balanced

Reflective

In IB program, we focus on effective oral and written communication of and with the students throughout the course. Students are encouraged to carry out original investigations in each field of study while inculcating elements of research in them. This course aims at holistic development of a child while preparing them to face challenges of today's increasingly complex world.

THE IB DIPLOMA PROGRAMME MODEL

The vision of a curriculum of breadth, depth and flexibility is today known as the Diploma Programme Model, with six academic areas surrounding the Learner Profile and a set of Core elements.



<http://www.ibo.org/en/programmes/diploma-programme/>

IB DIPLOMA PROGRAMME REQUIREMENTS

Theory of Knowledge (TOK), Creativity, Activity, Service (CAS) and Extended Essay (EE) are core elements of IB Diploma Programme. Language acquisition (Group 1), Studies in Language and Literature (Group 2), Individual and Societies (Group 3), Sciences (Group 4), Mathematics (Group 5) and The Arts (Group 6) are the subject groups incorporated by IB as principal domains of knowledge.

Language acquisition (Group 1)– This group consists of mainly English, Spanish and French as Language A. Other languages are also included in this group. The courses available in this group are (i) language and literature and (ii) literature offered at both Standard Level (SL) and Higher Level (HL). Literature and Performance course is available in Standard Level (SL) only.

Studies in Language and Literature (Group 2)- It consists of the nearly 80 additional languages offered as Language B at both standard level (SL) and Higher level (H), or Ab Initio (SL only).

Individual and Societies (Group 3)- This group consists of courses like Business Management, Geography, History, Information technology in a global society



(ITGS), Philosophy, Psychology, Social and cultural anthropology offered at both Standard level (SL) and Higher level (HL).

Sciences (Group 4) - This group consists of Chemistry, Biology, Physics, Design Technology and Computer Science offered at both the Standard Level (SL) and Higher Level (HL). In this group, Environmental Systems and Societies (transdisciplinary between group 3 and group 4) and Sports, Exercise and Health Science are offered at Standard Level (SL) only.

Mathematics (Group 5) - This group consists of three main mathematics courses: Mathematical Studies SL (Standard Level), Mathematics SL or Mathematics HL (Higher Level). Further Mathematics HL can be taken as an elective in addition to Mathematics HL

The Arts (Group 6) - This group consists of five courses like Dance, Music, Theatre, Visual Arts, and Film at both Standard Level (SL) and Higher Level (HL): Literature and Performance (transdisciplinary between Groups 1 and 6) is also available at SL in this group.

The Group 6 is also called Electives group as students may choose from amongst the courses of other five groups in place of a course from this group. IB DP two-year programme usually consists of following subjects.

Core Subjects	Courses from Group 1 to Group 6
(i) Theory of Knowledge (TOK)	(i) 3 courses at higher level (HL)
(ii) Extended Essay (EE)	(ii) 3 courses at standard level (SL)
(iii) Creativity Activity Service (CAS)	



One subject from each group must be chosen. If students select English A and Hindi A or Japanese A, this qualifies them for a Bilingual IB Diploma on the condition that the candidate obtains a level 3 or greater in both subjects.

Group	Subjects
Group 1- Studies in Language and Literature	(i) English A: Language and Literature SL/HL (ii) Japanese A: Language and Literature SL/HL
Group 2 – Language acquisition	(i) English B SL/HL (ii) Japanese B SL/HL (iii) Japanese Ab Initio
Group 3–Individuals and Societies	(i) Psychology SL/HL (ii) Business Management SL/HL (iii) Economics SL/HL
Group 4–Experimental Sciences	(i) Biology SL/HL (ii) Physics SL/HL (iii) Chemistry SL/HL (iv) Computer Science SL/HL
Group 5–Mathematics	(i) Mathematics: analysis and approaches SL/HL (ii) Mathematics: applications and interpretation SL/HL
Group 6–The Arts and Electives	Either of Group 3 or Group 4 or Group 5 subjects may be chosen.

India International School in Japan

IB SUBJECT OPTIONS FORM 2021-2023



One subject from each group must be chosen. Students are required to select 3 HL and 3 SL subjects.

Group	Subjects available	Subject	Level
Group 1 - Studies in Language and Literature	(i) English A: Language and Literature SL/HL (ii) Japanese A: Language and Literature SL/HL		
Group 2 – Language Acquisition	(iv) English B SL/HL (v) Japanese B SL/HL (vi) Japanese Ab Initio		
Group 3 – Individuals and Societies	(i) Psychology SL/HL (ii) Business Management SL/HL (iii) Economics SL/HL		
Group 4 – Experimental Sciences	(i) Biology SL/HL (ii) Physics SL/HL (iii) Chemistry SL/HL (iv) Computer Science SL/HL		
Group 5 – Mathematics	(i) Mathematics: analysis and approaches SL/HL (ii) Mathematics: applications and interpretation SL/HL		
Group 6 – The Arts and Electives	Either of Group 3 or Group 4 or Group 5 subjects may be chosen.		

Student's Name: _____ Student's signature: _____

Parents' approval: I, hereby, endorse and consent to selection of IB subject options by my son/
daughter _____

Parent's signature: _____ Date: _____

IISJ IB PROGRAMME FEE STRUCTURE



IISJ has consistently maintained a fee structure to lessen financial burdens on parents while providing quality education. We have strived for providing good English medium education to all the expatriates who are not in position to pay exorbitant school fees under various headings. Being not-for-profit organization, we charge for covering operational costs only. So, there may be periodic adjustments in fee structure but it will not include additional fee under separate heading.

IB assessment fees are based on fixed foreign exchanges like US dollar and due to fluctuation in conversion rate, the registration and assessment fees in Japanese Yen may fluctuate. For convenience all fees are indicated in Japanese and adjustments in IB fees will be done as per the currency conversion rate of the day.

Fee category	Amount	Day of payment	Method of payment
Application Fee	JPY 10,000	At the time of admission in IISJ	All payments are to be made by <u>bank transfers</u> to the following account of IISJ. Sumitomo Mitsui Banking Corporation, Marunouchi Branch (Branch code 245), Account type - Touza, Account No.: 1008024 Beneficiary: Bank of India, Tokyo Branch.
IB registration fee	JPY 20,000	At the time of admission in IISJ	
Tuition Fee	JPY 1,500,000	(a) First installment by May 15: JPY 750,000 (b) Second installment by November 15: JPY 750,000	Please mention IISJ next to remitter's name.
IB Diploma Examination Fee	JPY 160,000	Grade 12 only (will be notified in second half of Grade 12)	

Note: Please send a mail to iisjtokyo@iisjapan.com after every payment to notify the day of money transfer so that we can make confirmation of the payment at the earliest.

STUDENT TIMETABLE

The student timetable at IISJ is 8-10 forty-minute lessons per day. During two years of IBDP, students will complete a minimum of 150 hours of classes for an SL subject and 240 hours for an HL subject. Generally, TOK, CAS and EE are completed outside of the regular school timetable



and around 100 hours are used for them. For TOK and EE, there are 4 lessons per week provided for monitoring and guidance to the students. Similarly, 5 lessons are allocated for CAS so that student can carry out CAS related activities as well as seek guidance and suggestions from CAS coordinator.

ASSESSMENT IN THE IB DIPLOMA PROGRAMME

IB assessment philosophy centers on preparing students towards university education. IB uses criterion-based grading system where each student's performance is measured against well-defined levels of achievement. Subject grades reflect attainment of knowledge and skills relative to set standards that are applied equally to all schools.

IB assessment consists of two components: (i) Internal Assessments (IAs) and (ii) External Assessments (EAs). Internal assessments consist of assignments completed during the two years period of IB DP. These are internally assessed by IISJ teachers that externally moderated by IB examiners. Internal assessment usually plays very crucial role in the final grade achieved by the students in the concerned courses.

External Assessments are done around the end of the two years in IB DP program and are externally graded by IB Examiners. Some assessment tasks are conducted and overseen by teachers without the restrictions of examination conditions but are then marked externally by examiners. Examples of these include language written tasks, essays for Theory of Knowledge and Extended Essays.

ASSESSMENT CRITERIA IN IB DIPLOMA

Based on total marks secured by the students in both IAs and EAs, students are given marks from 1 to 7 for each of the group subjects. Similarly, students can receive maximum 3 bonus points for TOK/EE. So, altogether students can secure maximum 45 marks. For receiving IB Diploma, students must complete 150 hours of CAS also.

IB MARKS DESCRIPTION	
IB Assessment Marks	Performance level
7	Excellent Performance
6	Very Good Performance
5	Good Performance
4	Satisfactory Performance
3	Mediocre Performance
2	Poor Performance
1	Very Poor Performance

The Diploma point matrix for bonus points in TOK & EE (From May 2015)

TOK/EE	Excellent A	Good B	Satisfactory C	Mediocre D	Elementary E
Excellent A	3	3	2	2	Failing condition
Good B	3	2	2	1	
Satisfactory C	2	2	1	0	
Mediocre D	2	1	0	0	
Elementary E	Failing condition				

ELIGIBILITY CRITERIA FOR IB DIPLOMA CERTIFICATE

In order to achieve the IB Diploma a candidate must fulfill certain requirements; at its most basic a candidate must achieve at least 24 points from their combined grades in six subjects, together with



their grades for theory of knowledge and the extended essay, and also complete the Creativity, Activity, Service (CAS) element. However, to ensure a diploma reflects sufficient breadth in achievement across subjects and the core there are requirements stated in articles of the General regulations: Diploma Programme. These are the “requirements” and are phrased positively. The “failing conditions” are an interpretation of these requirements intended to indicate why a candidate has failed to achieve the diploma.

Diploma Level	HL Subject	HL Subject	HL Subject	SL Subject	SL Subject	SL Subject	TOK/ EE	Total Marks
Excellent	7	7	7	7	7	7	3	45
Very Good	6	6	6	6	6	6	3	39
Good	5	5	5	5	5	5	3	33
Satisfactory	4	4	4	3	3	3	3	24
Failing conditions	<p><u>From the May 2015 session</u> the following failing conditions and associated codes will replace those in current use.</p> <ol style="list-style-type: none">1. CAS requirements have not been met.2. Candidate's total points are fewer than 24.3. An N has been given for theory of knowledge, extended essay or for a contributing subject.4. A grade E has been awarded for one or both of theory of knowledge and the extended essay.5. There is a grade 1 awarded in a subject/level.6. Grade 2 has been awarded three or more times (HL or SL).7. Grade 3 or below has been awarded four or more times (HL or SL).8. Candidate has gained fewer than 12 points on HL subjects (for candidates who register for four HL subjects, the three highest grades count).9. Candidate has gained fewer than 9 points on SL subjects (candidates who register for two SL subjects must gain at least 5 points at SL).							

SUBJET OUTLINES

GROUP 1

LANGUAGE A: LANGUAGE AND LITERATURE (ENGLISH, JAPANESE)



Group 1 courses are designed to support future academic study by developing a high social, aesthetic, and cultural literacy, as well as effective communication skills. While there is significant difference in the texts presented for study in the three courses, they will clearly overlap somewhat. There is no aim for each course to define separate territory. Instead, the main difference lies in the different areas of focus each takes. The focus of the language A: language and literature course is directed towards developing and understanding the constructed nature of meanings generated by language and the function of context in this process. Literature and performance allow students to combine literary analysis with the investigation of the role of performance in our understanding of dramatic literature.

Language A: language and literature comprise four parts—two relate to the study of language and two to the study of literature.

The study of the texts produced in a language is central to an active engagement with language and culture and, by extension, to how we see and understand the world in which we live. A key aim of the language A: language and literature course is to encourage students to question the meaning generated by language and texts, which, it can be argued, is rarely straightforward and unambiguous. Helping students to focus closely on the language of the texts they study and to become aware of the role of each text's wider context in shaping its meaning is central to the course. The language A: language and literature course aims to develop in students' skills of textual analysis and the understanding that texts, both literary and non-literary, can be seen as autonomous yet simultaneously related to culturally determined reading practices. The course is designed to be flexible; teachers can 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. An understanding of the ways in which formal elements are used to create meaning in a text is combined with an exploration of how that meaning is affected by reading practices that are culturally defined and by the circumstances of production and reception.

Distinction between SL and HL

The model for language A: language and literature is the same at SL and HL, but there are significant quantitative and qualitative differences between the levels. In the literature sections the number of texts prescribed is greater at HL than at SL. In the language sections students are generally expected to cover many more texts of all kinds at HL than at SL. Two of the assessment tasks at SL are significantly easier than the comparable tasks at HL. The first is the paper 1 textual analysis, where SL students address and analyse only one passage, while HL students make a comparative analysis of two passages. The second is the written tasks, where HL students must produce four tasks, rather than the three produced by SL students. Two of these tasks are submitted for external assessment at HL, while only one is submitted at SL. One of the assessed tasks submitted at HL must be a critical response that addresses one of six set questions and requires students to explore the values, attitudes and beliefs that are implied in the texts they select for this task.

SYLLABUS OUTLINE – SL AND HL

Syllabus component	Teaching hours	
	SL	HL
Part 1: Language in cultural context Texts are chosen from a variety of sources, genres and media.	40	60
Part 2: Language and mass communication Texts are chosen from a variety of sources, genres and media.	40	60
Part 3: Literature—texts and contexts SL: Two texts, one of which is a text in translation from the prescribed literature in translation (PLT) list and one, written in the language A studied, from the prescribed list of authors (PLA) for the language A studied, or chosen freely. HL: Three texts, one of which is a text in translation chosen from the prescribed literature in translation (PLT) list and one from the prescribed list of authors (PLA) for the language A studied. The other may be chosen freely.	40	70
Part 4: Literature—critical study SL: Two texts, both of which are chosen from the prescribed list of authors (PLA) for the language A studied. HL: Three texts, all of which are chosen from the prescribed list of authors (PLA) for the language A studied.	30	50
Total teaching hours	150	240



Assessment component	Weighting
External assessment (3 hours) Paper 1: Textual analysis (1 hour 30 minutes) The paper consists of two unseen texts. Students write an analysis of one of these texts. (20 marks) Paper 2: Essay (1 hour 30 minutes) In response to one of six questions students write an essay based on both the literary texts studied in part 3. The questions are the same at HL but the assessment criteria are different. (25 marks) Written task Students produce at least three written tasks based on material studied in the course. Students submit one written task for external assessment. (20 marks) This task must be 800–1,000 words in length plus a rationale of 200–300 words.	70% 25% 25% 20%
Internal assessment This component is internally assessed by the teacher and externally moderated by the IB at the end of the course. Individual oral commentary Students comment on an extract from a literary text studied in part 4 of the course. (30 marks) Students are given two guiding questions. Further oral activity Students complete at least two further oral activities, one based on part 1 and one based on part 2 of the course. The mark of one further oral activity is submitted for final assessment. (30 marks)	30% 15% 15%

Assessment component	Weighting
External assessment (4 hours) Paper 1: Comparative textual analysis (2 hours) The paper consists of two pairs of unseen texts. Students write a comparative analysis of one pair of texts. (20 marks) Paper 2: Essay (2 hours) In response to one of six questions students write an essay based on at least two of the literary texts studied in part 3. The questions are the same at SL but the assessment criteria are different. (25 marks) Written tasks Students produce at least four written tasks based on material studied in the course. Students submit two of these tasks for external assessment. (20 marks for each task) One of the tasks submitted must be a critical response to one of the prescribed questions for the HL additional study. Each task must be 800–1,000 words in length; task 1 should be accompanied by a rationale of 200–300 words, while task 2 should be accompanied by a short outline.	70% 25% 25% 20%
Internal assessment This component is internally assessed by the teacher and externally moderated by the IB at the end of the course. Individual oral commentary Students comment on an extract from a literary text studied in part 4 of the course. (30 marks) Students are given two guiding questions. Further oral activity Students complete at least two further oral activities, one based on part 1 and one based on part 2 of the course. The mark of one further oral activity is submitted for final assessment. (30 marks)	30% 15% 15%

LANGUAGE B (ENGLISH, JAPANESE, FRENCH)

Language B is an additional language-learning course designed for students with some previous learning of that language. It may be studied at either SL or HL. The focus of the course is on language acquisition and development of language skills. These language skills should be developed through the study and use of a range of written and spoken material. Such material will extend from everyday oral exchanges to literary texts and should be related to the culture(s) concerned. The material should be chosen to enable students to develop mastery of language skills and intercultural understanding. It should not be intended solely for the study of specific subject matter or content.

Distinction between SL and HL

Most language B subjects are available at SL and HL. The courses give students the possibility of reaching a high degree of competence in an additional language while exploring the culture(s) where that language is spoken. The courses aim to develop the students' linguistic competence and intercultural understanding. There is a common syllabus at SL and HL (with literature as an additional component of the HL course). The differences between levels are determined by the assessment objectives, the depth and breadth of syllabus coverage, the assessment details, the assessment criteria, literature coverage and suggested teaching hours.

SYLLABUS OUTLINE

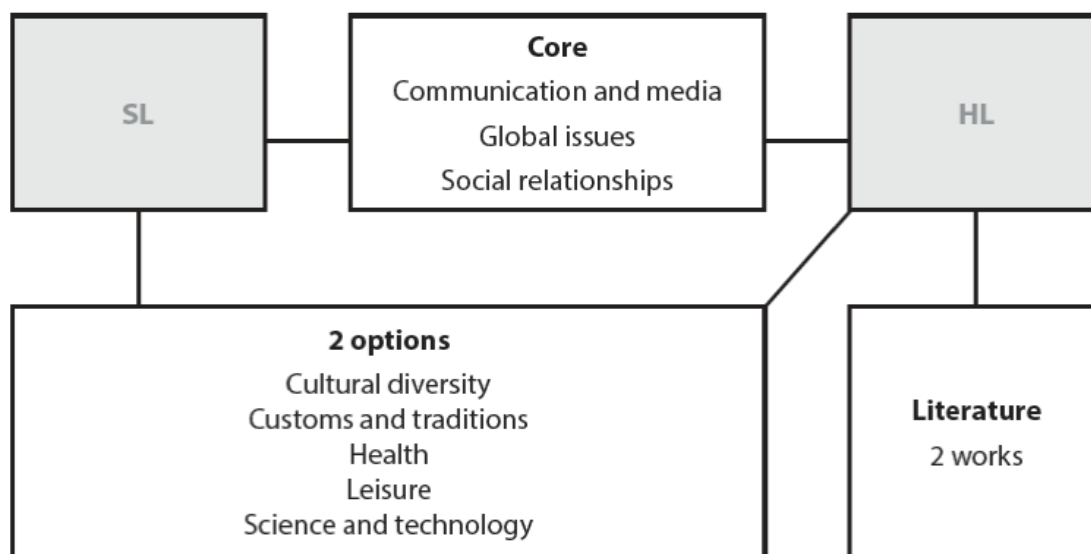


Figure 2
Language B syllabus outline

ASSESSMENT OUTLINE—SL



Assessment component	Weighting
External assessment	70%
Paper 1 (1 hour 30 minutes): Receptive skills Text-handling exercises on four written texts, based on the core.	25%
Paper 2 (1 hour 30 minutes): Written productive skills One writing exercise of 250–400 words from a choice of five, based on the options.	25%
Written assignment: Receptive and written productive skills Inter-textual reading followed by a written task of 300–400 words plus a 150–200 word rationale, based on the core.	20%
Internal assessment Internally assessed by the teacher and externally moderated by the IB.	30%
Individual oral (8–10 minutes) Based on the options: 15 minutes' preparation time and a 10 minute (maximum) presentation and discussion with the teacher.	20%
Interactive oral activity Based on the core: Three classroom activities assessed by the teacher.	10%



Assessment component	Weighting
External assessment	70%
Paper 1 (1 hour 30 minutes): Receptive skills Text-handling exercises on five written texts, based on the core.	25%
Paper 2 (1 hour 30 minutes): Written productive skills 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.	25%
Written assignment: Receptive and written productive skills Creative writing of 500–600 words plus a 150–250 word rationale, based on one or both of the literary texts read.	20%
Internal assessment Internally assessed by the teacher and externally moderated by the IB.	30%
Individual oral (8–10 minutes) Based on the options: 15 minutes' preparation time and a 10 minute (maximum) presentation and discussion with the teacher.	20%
Interactive oral activity Based on the core: Three classroom activities assessed by the teacher.	10%



PSYCHOLOGY

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

IB psychology examines the interaction of biological, cognitive, and sociocultural influences on human behavior, thereby adopting an integrative approach. Understanding how psychological knowledge is generated, developed, and applied enables students to achieve a greater understanding of themselves and appreciate the diversity of human behavior. The ethical concerns raised by the methodology and application of psychological research are key considerations in IB psychology.

Psychology and the international dimension

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

Distinction between SL and HL

Both SL and HL students are assessed on the syllabus core (levels of analysis) in paper 1. In addition:

- SL students are assessed on their knowledge and comprehension of one option in paper 2, whereas HL students are assessed on two options
- HL students are assessed on their knowledge and comprehension of qualitative research methodology in paper 3 in the internal assessment, the report of a simple experimental study conducted by HL students requires inferential statistical analysis and a more in-depth approach than that required of SL students.

SYLLABUS OUTLINE

Syllabus component	Teaching hours	
	SL	HL
Part 1: Core (SL/HL) <ul style="list-style-type: none"> The biological level of analysis The cognitive level of analysis The sociocultural level of analysis 	90	90
Part 2: Options (SL/HL) <ul style="list-style-type: none"> Abnormal psychology Developmental psychology Health psychology Psychology of human relationships Sport psychology 	30	60
Part 3: Qualitative research methodology (HL only) <ul style="list-style-type: none"> Qualitative research in psychology 		50
Part 4: Simple experimental study (SL/HL) <ul style="list-style-type: none"> Introduction to experimental research methodology 	30	40
Total teaching hours	150	240

ASSESSMENT OUTLINE – SL

Assessment component	Weighting
External assessment (3 hours)	75%
Paper 1 (2 hours) Section A: Three compulsory questions on part 1 of the syllabus. Section B: Three questions on part 1 of the syllabus. Students choose one question to answer in essay form. (46 marks)	50%
Paper 2 (1 hour) Fifteen questions on part 2 of the syllabus. Students choose one question to answer in essay form. (22 marks)	25%
Internal assessment A report of a simple experimental study conducted by the student. (20 marks)	25%

ASSESSMENT OUTLINE –HL

Assessment component	Weighting
External assessment (4 hours)	80%
Paper 1 (2 hours) Section A: Three compulsory questions on part 1 of the syllabus. Section B: Three questions on part 1 of the syllabus. Students choose one question to answer in essay form. (46 marks)	35%
Paper 2 (2 hours) Fifteen questions on part 2 of the syllabus. Students choose two questions to answer in essay form. (44 marks)	25%
Paper 3 (1 hour) Three compulsory questions based on an unseen text, covering part 3 of the syllabus. (30 marks)	20%
Internal assessment A report of a simple experimental study conducted by the student. (28 marks)	20%

BUSINESS MANAGEMENT



Business management is a rigorous, challenging, and dynamic discipline in the individuals and societies subject group. This course is designed to develop students' knowledge and understanding of business management theories, as well as their ability to apply a range of tools and techniques. Students learn to analyse, discuss, and evaluate business activities at local, national, and international levels. The course covers a range of organizations from all sectors, as well as the socio-cultural and economic contexts in which those organizations operate.

Although business management shares many skills and areas of knowledge with other humanities and social sciences, it is distinct in several ways. For example, business management is the study of decision-making within an organization, wherein business functions, management processes and decision-making in contemporary contexts of strategic uncertainty are studied. It examines how business decisions are influenced by factors internal and external to an organization, and how these decisions impact upon its stakeholders, both internally and externally. Business management also explores how individuals and groups interact within an organization, how they may be successfully managed and how they can ethically optimize the use of resources in a world with increasing scarcity and concern for sustainability. Business management is, therefore, perfectly placed within the individuals and societies subject area: aiming to develop in students an appreciation both for our individuality and our collective purposes.

Emphasis is placed on strategic decision-making and the operational business functions of human resource management, finance and accounts, marketing, and operations management. Links between the topics are central to the course, as this integration promotes a holistic overview of business management. Through the exploration of six concepts underpinning the subject (change, culture, ethics, globalization, innovation, and strategy), the business management course allows students to develop their understanding of interdisciplinary concepts from a business management perspective.

The course encourages the appreciation of ethical concerns, as well as issues of corporate social responsibility (CSR), at both a local and global level. Through the study of topics such as human resource management, organizational growth and business strategy, the course aims to develop transferable skills relevant to today's students. These include the ability to: think critically; make ethically sound and well-informed decisions; appreciate the pace, nature, and significance of change; think strategically; and undertake long term planning, analysis and evaluation. The course also develops subject-specific skills, such as financial analysis.

Distinction between SL and HL

The HL course in business management differs from the SL course in business management in terms of the:

- recommended hours devoted to teaching (240 hours for HL compared to 150 hours for SL)
- extra depth and breadth required (extension units for HL)
- nature of the internal assessment task
- nature of the examination questions.

SYLLABUS OUTLINE

Syllabus component	Teaching hours	
	SL	HL
Unit 1: Business organization and environment 1.1 Introduction to business management 1.2 Types of organizations 1.3 Organizational objectives 1.4 Stakeholders 1.5 External environment 1.6 Growth and evolution 1.7 Organizational planning tools (HL only)	40	50
Unit 2: Human resource management 2.1 Functions and evolution of human resource management 2.2 Organizational structure 2.3 Leadership and management 2.4 Motivation 2.5 Organizational (corporate) culture (HL only) 2.6 Industrial/employee relations (HL only)	15	30
Unit 3: Finance and accounts 3.1 Sources of finance 3.2 Costs and revenues 3.3 Break-even analysis 3.4 Final accounts (some HL only) 3.5 Profitability and liquidity ratio analysis 3.6 Efficiency ratio analysis (HL only) 3.7 Cash flow 3.8 Investment appraisal (some HL only) 3.9 Budgets (HL only)	35	50

Syllabus component	Teaching hours	
	SL	HL
Unit 4: Marketing 4.1 The role of marketing 4.2 Marketing planning (including introduction to the four Ps) 4.3 Sales forecasting (HL only) 4.4 Market research 4.5 The four Ps (product, price, promotion, place) 4.6 The extended marketing mix of seven Ps (HL only) 4.7 International marketing (HL only) 4.8 E-commerce	35	50
Unit 5: Operations management 5.1 The role of operations management 5.2 Production methods 5.3 Lean production and quality management (HL only) 5.4 Location 5.5 Production planning (HL only) 5.6 Research and development (HL only) 5.7 Crisis management and contingency planning (HL only)	10	30
Internal assessment	15	30
Total teaching hours	150	240

Assessment component	Weighting
<p>External assessment (3 hours)</p> <p>Paper 1 (1 hour and 15 minutes)</p> <p>Based on a case study issued in advance, with additional unseen material included in section B.</p> <p>Assessment objectives 1, 2, 3, 4 (50 marks)</p> <p><i>Section A</i></p> <p>Syllabus content: Units 1–5</p> <p>Students answer three of four structured questions. (10 marks per question)</p> <p><i>Section B</i></p> <p>Syllabus content: Units 1–5</p> <p>Students answer one compulsory structured question. (20 marks)</p> <p>Paper 2 (1 hour and 45 minutes)</p> <p>Assessment objectives 1, 2, 3, 4 (60 marks)</p> <p><i>Section A</i></p> <p>Syllabus content: Units 1–5</p> <p>Students answer one of two structured questions based on stimulus material with a quantitative focus. (20 marks)</p> <p><i>Section B</i></p> <p>Syllabus content: Units 1–5</p> <p>Students answer one of three structured questions based on stimulus material. (20 marks)</p> <p><i>Section C</i></p> <p>Syllabus content: Units 1–5</p> <p>Students answer one of three extended response questions. This question is based primarily on two concepts that underpin the course. (20 marks).</p>	<p>75%</p> <p>35%</p> <p>40%</p>
<p>Internal assessment (15 teaching hours)</p> <p>This component is internally assessed by the teacher and externally moderated by the IB at the end of the course.</p> <p>Written commentary</p> <p>Students produce a written commentary based on three to five supporting documents about a real issue or problem facing a particular organization. Maximum 1500 words. (25 marks)</p>	<p>25%</p>

Assessment component	Weighting
<p>External assessment (4 hours and 30 minutes)</p> <p>Paper 1 (2 hour and 15 minutes) Based on a case study issued in advance, with additional unseen material included in sections B and C. Assessment objectives 1, 2, 3, 4 (70 marks)</p> <p><i>Section A</i> Syllabus content: Units 1–5 including HL extension topics Students answer three of four structured questions. (10 marks per question)</p> <p><i>Section B</i> Syllabus content: Units 1–5 including HL extension topics Students answer one compulsory structured question. (20 marks)</p> <p><i>Section C</i> Syllabus content: Units 1–5 including HL extension topics Students answer one compulsory extended response question primarily based on HL extension topics. (20 marks)</p> <p>Paper 2 (2 hour and 15 minutes) Assessment objectives 1, 2, 3, 4 (80 marks)</p> <p><i>Section A</i> Syllabus content: Units 1–5 including HL extension topics Students answer one of two structured question based on stimulus material with a quantitative focus. (20 marks)</p> <p><i>Section B</i> Syllabus content: Units 1–5 including HL extension topics Students answer two of three structured questions based on stimulus material. (20 marks per question)</p> <p><i>Section C</i> Syllabus content: Units 1–5 including HL extension topics Students answer one of three extended response questions. This question is based primarily on two concepts that underpin the course. (20 marks)</p>	<p>75% 35%</p> <p>40%</p>
Assessment component	Weighting
<p>Internal assessment (30 teaching hours) This component is internally assessed by the teacher and externally moderated by the IB at the end of the course.</p> <p>Research project Students research and report on an issue facing an organization or a decision to be made by an organization (or several organizations). Maximum 2000 words. (25 marks)</p>	<p>25%</p>



GROUP 4

BIOLOGY

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. Estimates vary, but over the course of evolution 4 billion species could have been produced. Most of these flourished for a period and then became extinct as new, better adapted species took their place. There have been at least five periods when very large numbers of species became extinct and biologists are concerned that another mass extinction is under way, caused this time by human activity. Nonetheless, there are more species alive on Earth today than ever before. This diversity makes biology both an endless source of fascination and a considerable challenge.

Distinction between SL and HL

Group 4 students at standard level (SL) and higher level (HL) undertake a common core syllabus, a common internal assessment (IA) scheme and have some overlapping elements in the option studied. They are presented with a syllabus that encourages the development of certain skills, attributes, and attitudes, as described in the “Assessment objectives” section of the guide.

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.

SYLLABUS OUTLINE

Syllabus component	Teaching hours	
	SL	HL
Core	95	
1. Cell biology	15	
2. Molecular biology	21	
3. Genetics	15	
4. Ecology	12	
5. Evolution and biodiversity	12	
6. Human physiology	20	
Additional higher level (AHL)		60
7. Nucleic acids		9
8. Metabolism, cell respiration and photosynthesis		14
9. Plant biology		13
10. Genetics and evolution		8
11. Animal physiology		16
Option	15	25
A. Neurobiology and behaviour	15	25
B. Biotechnology and bioinformatics	15	25
C. Ecology and conservation	15	25
D. Human physiology	15	25
Practical scheme of work	40	60
Practical activities	20	40
Individual investigation (internal assessment–IA)	10	10
Group 4 project	10	10
Total teaching hours	150	240

The recommended teaching time is 240 hours to complete HL and 150 hours to complete SL courses as stated in the document *General regulations: Diploma Programme for students and their legal guardians* (2011) (page 4, Article 8.2).



ASSESSMENT OUTLINE—SL

Component	Overall weighting (%)	Approximate weighting of objectives (%)		Duration (hours)
		1+2	3	
Paper 1	20	10	10	3¼
Paper 2	40	20	20	1¼
Paper 3	20	10	10	1
Internal assessment	20	Covers objectives 1, 2, 3 and 4		10

ASSESSMENT OUTLINE—HL

Component	Overall weighting (%)	Approximate weighting of objectives (%)		Duration (hours)
		1+2	3	
Paper 1	20	10	10	1
Paper 2	36	18	18	2¼
Paper 3	24	12	12	1¼
Internal assessment	20	Covers objectives 1, 2, 3 and 4		10



PHYSICS

Experience shows that students will be able to study a group 4 science subjects at SL successfully with no background in, or previous knowledge of, science. Their approach to study, characterized by the specific IB learner profile attributes—inquirers, thinkers, and communicators— will be significant here. However, for most students considering the study this group subject at HL, while there is no intention to restrict access to group 4 subjects, some previous exposure to the specific group 4 subjects would be necessary. Specific topic details are not specified but students who have undertaken the IB Middle Years Programme (MYP) or CBSE or IGCSE science subject would be well prepared. Other national science qualifications or a school-based science course would also be suitable preparation for study of a group 4 subject at HL.

Difference between SL and HL

Group 4 students at standard level (SL) and higher level (HL) undertake a common core syllabus, a common internal assessment (IA) scheme and have some overlapping elements in the options studied. They are presented with a syllabus that encourages the development of certain skills, attributes, and attitudes, as described in the “Objectives” section of this guide. 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, to study additional topics and to study extension material of a more demanding nature in the common options. The distinction between SL and HL is one of breadth and depth.

SYLLABUS OUTLINE

Syllabus component	Recommended teaching hours	
	SL	HL
Core	95	
1. Measurements and uncertainties	5	
2. Mechanics	22	
3. Thermal physics	11	
4. Waves	15	
5. Electricity and magnetism	15	
6. Circular motion and gravitation	5	
7. Atomic, nuclear and particle physics	14	
8. Energy production	8	
Additional higher level (AHL)		60
9. Wave phenomena		17
10. Fields		11
11. Electromagnetic induction		16
12. Quantum and nuclear physics		16
Option	15	25
A. Relativity	15	25
B. Engineering physics	15	25
C. Imaging	15	25
D. Astrophysics	15	25
Practical scheme of work	40	60
Practical activities	20	40
Individual investigation (internal assessment – IA)	10	10
Group 4 project	10	10
Total teaching hours	150	240

Component	Overall weighting (%)	Approximate weighting of objectives (%)		Duration (hours)
		1+2	3	
Paper 1	20	10	10	$\frac{3}{4}$
Paper 2	40	20	20	$1\frac{1}{4}$
Paper 3	20	10	10	1
Internal assessment	20	Covers objectives 1, 2, 3 and 4		10

ASSESSMENT OUTLINE—HL

Component	Overall weighting (%)	Approximate weighting of objectives (%)		Duration (hours)
		1+2	3	
Paper 1	20	10	10	1
Paper 2	36	18	18	$2\frac{1}{4}$
Paper 3	24	12	12	$1\frac{1}{4}$
Internal assessment	20	Covers objectives 1, 2, 3 and 4		10

CHEMISTRY



Chemistry is an experimental science that combines academic study with the acquisition of practical and investigational skills. It is often called the central science, as chemical principles underpin both the physical environment in which we live and all biological systems. Apart from being a subject worthy of study, chemistry is a prerequisite for many other courses in higher education, such as medicine, biological science and environmental science, and serves as useful preparation for employment.

Earth, water, air and fire are often said to be the four classical elements. They have connections with Hinduism and Buddhism. The Greek philosopher Plato was the first to call these entities elements. The study of chemistry has changed dramatically from its origins in the early days of alchemists, who had as their quest the transmutation of common metals into gold. Although today alchemists are not regarded as being true scientists, modern chemistry has the study of alchemy as its roots. Alchemists were among the first to develop strict experimentation processes and laboratory techniques. Robert Boyle, often credited with being the father of modern chemistry, began experimenting as an alchemist.

Despite the exciting and extraordinary development of ideas throughout the history of chemistry, certain things have remained unchanged. Observations remain essential at the very core of chemistry, and this sometimes requires decisions about what to look for. The scientific processes carried out by the most eminent scientists in the past are the same ones followed by working chemists today and, crucially, are also accessible to students in schools. The body of scientific knowledge has grown and complexity, and the tools and skills of theoretical and experimental chemistry have become so specialized, that it is difficult (if not impossible) to be highly proficient in both areas. While students should be aware of this, they should also know that the free and rapid interplay of theoretical ideas and experimental results in the public scientific literature maintains the crucial link between these fields.

The Diploma Programme chemistry 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. The course is available at both standard level (SL) and higher level (HL), and therefore accommodates students who wish to study chemistry as their major subject in higher education and those who do not.

Difference between SL and HL

Group 4 students at standard level (SL) and higher level (HL) undertake a common core syllabus, a common internal assessment (IA) scheme and have some overlapping elements in the options studied. They are presented with a syllabus that encourages the development of certain skills, attributes, and attitudes, as described in the “Objectives” section of this guide. 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, to study additional topics and to study extension material of a more demanding nature in the common options. The distinction between SL and HL is one of breadth and depth.

SYLLABUS OUTLINE

Syllabus component	Recommended teaching hours	
	SL	HL
Core	95	
1. Stoichiometric relationships	13.5	
2. Atomic structure	6	
3. Periodicity	6	
4. Chemical bonding and structure	13.5	
5. Energetics/thermochemistry	9	
6. Chemical kinetics	7	
7. Equilibrium	4.5	
8. Acids and bases	6.5	
9. Redox processes	8	
10. Organic chemistry	11	
11. Measurement and data processing	10	
Additional higher level (AHL)		60
12. Atomic structure		2
13. The periodic table—the transition metals		4
14. Chemical bonding and structure		7
15. Energetics/thermochemistry		7
16. Chemical kinetics		6
17. Equilibrium		4
18. Acids and bases		10
19. Redox processes		6
20. Organic chemistry		12
21. Measurement and analysis		2
Option	15	25
A. Materials	15	25
B. Biochemistry	15	25
C. Energy	15	25
D. Medicinal chemistry	15	25

First assessment 2016

Component	Overall weighting (%)	Approximate weighting of objectives (%)		Duration (hours)
		1+2	3	
Paper 1	20	10	10	$\frac{3}{4}$
Paper 2	40	20	20	$1\frac{1}{4}$
Paper 3	20	10	10	1
Internal assessment	20	Covers objectives 1, 2, 3 and 4		10

ASSESSMENT OUTLINE—HL

First assessment 2016

Component	Overall weighting (%)	Approximate weighting of objectives (%)		Duration (hours)
		1+2	3	
Paper 1	20	10	10	1
Paper 2	36	18	18	$2\frac{1}{4}$
Paper 3	24	12	12	$1\frac{1}{4}$
Internal assessment	20	Covers objectives 1, 2, 3 and 4		10

COMPUTER SCIENCE



Computer science requires an understanding of the fundamental concepts of computational thinking as well as knowledge of how computers and other digital devices operate.

The Diploma Programme computer science course is engaging, accessible, inspiring, and rigorous. It has the following characteristics.

- draws on a wide spectrum of knowledge
- enables and empowers innovation, exploration, and the acquisition of further knowledge
- interacts with and influences cultures, society and how individuals and societies behave
- raises ethical issues
- is underpinned by computational thinking.

Computational thinking involves the ability to:

- think procedurally, logically, concurrently, abstractly, recursively and think ahead
- utilize an experimental and inquiry-based approach to problem-solving
- develop algorithms and express them clearly
- appreciate how theoretical and practical limitations affect the extent to which problems can be solved computationally.

During the course the student will develop computational solutions. This will involve the ability to:

- identify a problem or unanswered question
- design, prototype and test a proposed solution
- liaise with clients to evaluate the success of the proposed solution and make recommendations for future developments.

Computer science has links with subjects outside of group 4, notably information technology in a global society (ITGS), but it should be noted that there are clear differences between the subjects.

Distinction between SL and HL

While the skills and activities of computer science are common to students at both SL and HL, students at HL are required to study additional topics in the core, a case study and extension material of a more demanding nature in the option chosen. The distinction between SL and HL is therefore one of both breadth and depth.

Additionally, the HL course has 240 hours devoted to teaching, compared with 150 hours for the SL course.

Students at SL and HL in computer science study a common core consisting of:

- four topics (system fundamentals; computer organization; networks; and computational thinking, problem-solving and programming)
- one option (chosen from databases; modelling and simulation; web science; or object-oriented programming)
- one piece of internally assessed work, which includes a computational solution.

The HL course has three additional elements:

- three further topics (abstract data structures; resource management; control)



- additional and more demanding content for the option selected
- an additional externally assessed component based on a pre-seen case study of an organization or scenario; this requires students to research various aspects of the subject—which may include new technical concepts and additional subject content—in greater depth.

Prior learning

Experience shows that students will be able to study computer science at SL successfully with no background in, or previous knowledge of, computer science. Their approach to study, characterized by specific IB learner profile attributes—inquirers, thinkers, and communicators—will be significant here. Students who have undertaken the IB Middle Years Programme (MYP) or studied a similar course prior to commencing the IB Diploma Programme would also be well prepared.

The study of computer science at HL demands a higher level of problem-solving skills and the ability to understand and manipulate abstract concepts. Although no previous knowledge of computer science is required, some exposure to programming is desirable.

SYLLABUS OUTLINE

Syllabus component	Teaching hours	
	SL	HL
Core syllabus content SL/HL core The topics that must be studied, including some practical work, are: <ul style="list-style-type: none"> • Topic 1: System fundamentals (20 hours) • Topic 2: Computer organization (6 hours) • Topic 3: Networks (9 hours) • Topic 4: Computational thinking, problem-solving and programming (45 hours) HL extension The topics that must be studied, including some practical work, are: <ul style="list-style-type: none"> • Topic 5: Abstract data structures (23 hours) • Topic 6: Resource management (8 hours) • Topic 7: Control (14 hours) Case study Additional subject content introduced by the annually issued case study	80	80
Option SL/HL core HL extension Students study one of the following options: Option A: Databases Option B: Modelling and simulation Option C: Web science Option D: Object-oriented programming (OOP)	30	30
Internal assessment Solution Practical application of skills through the development of a product and associated documentation Group 4 project	10	10
Total teaching hours	150	240

It is essential that teachers are allowed the prescribed minimum number of teaching hours necessary to meet the requirements of the computer science course. At SL the minimum prescribed number of hours is 150 hours and at HL it is 240 hours.

Assessment component	Overall weighting (%)	Approximate weighting of objectives (%)				Duration
		1	2	3	4	
Paper 1	45	24	13	8	n/a	1 hour 30 minutes
Paper 2	25	13	7	5	n/a	1 hour
Internal assessment: Solution	30	9	8	4	9	30 hours

ASSESSMENT OUTLINE—HL

Assessment component	Overall weighting (%)	Approximate weighting of objectives (%)				Duration
		1	2	3	4	
Paper 1	40	21	12	7	n/a	2 hours 10 minutes
Paper 2	20	10	6	4	n/a	1 hour 20 minutes
Paper 3	20	9	7	4	n/a	1 hour
Internal assessment: Solution	20	6	5	3	6	30 hours

GROUP 5



MATHEMATICS SL

Mathematics has been described as the study of structure, order and relation that has evolved from the practices of counting, measuring, and describing objects. Mathematics provides a unique language to describe, explore and communicate the nature of the world we live in as well as being a constantly building body of knowledge and truth that is distinctive in its certainty. These two aspects of mathematics, a discipline that is studied for its intrinsic pleasure and a means to explore and understand the world we live in, are both separate yet closely linked.

Mathematics is driven by abstract concepts and generalization. This mathematics is drawn out of ideas and develops through linking these ideas and developing new ones. These mathematical ideas may have no immediate practical application. Doing such mathematics is about digging deeper to increase mathematical knowledge and truth. The new knowledge is presented in the form of theorems that have been built from axioms and logical mathematical arguments and a theorem is only accepted as true when it has been proven. The body of knowledge that makes up mathematics is not fixed; it has grown during human history and is growing at an increasing rate.

The side of mathematics that is based on describing our world and solving practical problems is often carried out in the context of another area of study. Mathematics is used in a diverse range of disciplines as both a language and a tool to explore the universe; alongside this its applications include analyzing trends, making predictions, quantifying risk, exploring relationships and interdependence.

Individual students have different needs, aspirations, interests, and abilities. For this reason, there are two different subjects in mathematics, each available at SL and HL. These courses are designed for different types of students: those who wish to study mathematics as a subject or to pursue their interests in areas related to mathematics, and those who wish to gain understanding and competence in how mathematics relates to the real world and to other subjects. Each course is designed to meet the needs of a particular group of students. Mathematics: analysis and approaches and Mathematics: applications and interpretation are both offered at SL and HL. Therefore, great care should be taken to select the course and level that is most appropriate for an individual student.

In making this selection, individual students should be advised to consider the following factors:

- their own abilities in mathematics and the type of mathematics in which they can be successful
- their own interest in mathematics and those areas of the subject that may hold the most interest for them
- their other choices of subjects within the framework of the DP or Career-related Programme (CP)
- their academic plans, in particular the subjects they wish to study in the future
- their choice of career.

Teachers are expected to assist with the selection process and to offer advice to students.

Mathematics: analysis and approaches

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 at both SL and HL, and proof by induction at HL.

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: analysis and approaches have a strong emphasis on the ability to construct, communicate and justify correct mathematical arguments.

Mathematics: analysis and approaches: Distinction between SL and HL

Students who choose Mathematics: analysis and approaches at SL or HL should be comfortable in the manipulation of algebraic expressions and enjoy the recognition of patterns and understand the mathematical generalization of these patterns. Students who wish to take Mathematics: analysis and approaches at higher level will have strong algebraic skills and the ability to understand simple proof. They will be students who enjoy spending time with problems and get pleasure and satisfaction from solving challenging problems.

SYLLABUS OUTLINE

Syllabus component	Suggested teaching hours	
	SL	HL
Topic 1—Number and algebra	19	39
Topic 2—Functions	21	32
Topic 3— Geometry and trigonometry	25	51
Topic 4—Statistics and probability	27	33
Topic 5 —Calculus	28	55
The toolkit and the mathematical exploration Investigative, problem-solving and modelling skills development leading to an individual exploration. The exploration is a piece of written work that involves investigating an area of mathematics.	30	30
Total teaching hours	150	240

All topics are compulsory. Students must study all the sub-topics 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 prior learning.

ASSESSMENT OUTLINE

First assessment 2021

Assessment component	Weighting
External assessment (3 hours) Paper 1 (90 minutes) No technology allowed. (80 marks) <i>Section A</i> Compulsory short-response questions based on the syllabus. <i>Section B</i> Compulsory extended-response questions based on the syllabus.	80% 40%
Paper 2 (90 minutes) Technology required. (80 marks) <i>Section A</i> Compulsory short-response questions based on the syllabus. <i>Section B</i> Compulsory extended-response questions based on the syllabus	40%
Internal assessment This component is internally assessed by the teacher and externally moderated by the IB at the end of the course. Mathematical exploration Internal assessment in mathematics is an individual exploration. This is a piece of written work that involves investigating an area of mathematics. (20 marks)	20%

Mathematics: applications and interpretation

This course recognizes the increasing role that mathematics and technology play in a diverse range of fields in a data-rich world. As such, it emphasizes the meaning of mathematics in context by focusing on topics that are often used as applications or in mathematical modelling. To give this understanding a firm base, this course also includes topics that are traditionally part of a pre-university mathematics course such as calculus and statistics.

The course makes extensive use of technology to allow students to explore and construct mathematical models. Mathematics: applications and interpretation will develop mathematical thinking, often in the context of a practical problem and using technology to justify conjectures.

Mathematics: applications and interpretation: Distinction between SL and HL

Students who choose Mathematics: applications and interpretation at SL or HL should enjoy seeing mathematics used in real-world contexts and to solve real-world problems. Students who wish to take Mathematics: applications and interpretation at higher level will have good algebraic skills and experience of solving real-world problems. They will be students who get pleasure and satisfaction when exploring challenging problems and who are comfortable to undertake this exploration using technology.



SYLLABUS OUTLINE - SL

Syllabus component	Suggested teaching hours—SL	Suggested teaching hours—HL
Topic 1—Number and algebra	16	29
Topic 2—Functions	31	42
Topic 3—Geometry and trigonometry	18	46
Topic 4—Statistics and probability	36	52
Topic 5—Calculus	19	41
The “toolkit” and Mathematical exploration Investigative, problem-solving and modelling skills development leading to an individual exploration. The exploration is a piece of written work that involves investigating an area of mathematics.	30	30
Total teaching hours	150	240

All topics are compulsory. Students must study all the sub-topics 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 prior learning.

SYLLABUS OUTLINE - HL

First assessment 2021	
Assessment component	Weighting
External assessment (5 hours) Paper 1 (120 minutes) No technology allowed. (110 marks) <i>Section A</i> Compulsory short-response questions based on the syllabus. <i>Section B</i> Compulsory extended-response questions based on the syllabus.	80% 30%
Paper 2 (120 minutes) Technology required. (110 marks) <i>Section A</i> Compulsory short-response questions based on the syllabus. <i>Section B</i> Compulsory extended-response questions based on the syllabus.	30%
Paper 3 (60 minutes) Technology required. (55 marks) Two compulsory extended response problem-solving questions.	20%
Internal assessment This component is internally assessed by the teacher and externally moderated by the IB at the end of the course. Mathematical exploration Internal assessment in mathematics is an individual exploration. This is a piece of written work that involves investigating an area of mathematics. (20 marks)	20%

ASSESSMENT OUTLINE – SL



First assessment 2021

Assessment component	Weighting
External assessment (3 hours) Paper 1 (90 minutes) Technology required. (80 marks) Compulsory short-response questions based on the syllabus. (80 marks)	80% 40%
Paper 2 (90 minutes) Technology required. (80 marks) Compulsory extended-response questions based on the syllabus. (80 marks)	40%
Internal assessment This component is internally assessed by the teacher and externally moderated by the IB at the end of the course. Mathematical exploration Internal assessment in mathematics is an individual exploration. This is a piece of written work that involves investigating an area of mathematics. (20 marks)	20%

ASSESSMENT OUTLINE – HL

First assessment 2021

Assessment component	Weighting
External assessment (5 hours) Paper 1 (120 minutes) Technology required. (110 marks) Compulsory short-response questions based on the syllabus.	80% 30%
Paper 2 (120 minutes) Technology required. (110 marks) Compulsory extended-response questions based on the syllabus.	30%
Paper 3 (60 minutes) Technology required. (55 marks) Two compulsory extended response problem-solving questions.	20%
Internal assessment This component is internally assessed by the teacher and externally moderated by the IB at the end of the course. Mathematical exploration Internal assessment in mathematics is an individual exploration. This is a piece of written work that involves investigating an area of mathematics. (20 marks)	20%



GROUP 6: ELECTIVES AND PATHWAYS

The IISJ usually allows the students to choose subjects according to their natural academic preferences. For that different pathway are considered for IB diploma in IB. Usually, group 6 subject is chosen from amongst the other groups to enable the students to achieve IB Diploma of their choice. One sample of IB pathways available for IISJ students is shown below.

Group	Liberal Arts	Science Bac.	Languages	Arts Bac. I	Arts Bac. II
Group 1	Language A (HL)	Language A	Language A (HL)	Language A (HL)	Language A(HL)
Group 2	Language B	Language B	Language A (HL)	Language B	Language B
Group 3	Humanity 1 (HL)	Humanity	Humanity	Humanity (HL)	Arts I (HL)
Group 4	Science	Science 1 (HL)	Science	Science	Science: ESS
Group 5	Mathematics	Mathematics (HL)	Mathematics	Mathematic	Mathematics
Group 6	Humanity 2 (HL)	Science 2 (HL)	Language B (HL)	Arts (HL)	Arts II (HL)

The group 3 and group 6 subjects may be offered by online teachers from PAMOJA Education. The details of course delivery can be accessed at <https://pamojaeducation.com/>.



MANDATORY IB CORE COURSES

THEORY OF KNOWLEDGE (TOK)

A key element in the educational philosophy of the IB is the Theory of Knowledge (TOK) course. The purpose of TOK is to stimulate critical reflection upon the knowledge and experience of students both within and outside the classroom. The course is ‘philosophical’ in the sense that it encourages students to acquire a critical awareness of what they and others know through the analysis of concepts, arguments and value judgments.

During the course, TOK students will consider the role of language, the requirements of logical rigor, value judgments, ways of knowing (language, sense perception, emotion, reason, imagination, faith, intuition, memory) and issues of knowledge and truth.

EXTENDED ESSAY (EE)

By the end of **November** of the second year of the IB Diploma program, students will have completed a substantial piece of independent work of up to 4,000 words in length with the guidance from a subject teacher and the IB Coordinator. The essay will derive from one of the subjects in the IB curriculum. The purpose of this exercise is to prepare students for university-level research work and to provide the opportunity for them to follow personal interests in greater depth. These essays are marked externally by IB examiners. "

CREATIVITY ACTIVITY AND SERVICE (CAS)

As part of the philosophy of educating the “whole person” the IB Diploma requires that students actively involve themselves in Creative, Activity, and Service (CAS) activities. Participation in activities such as community service, drama, band, sports, student council, MUN, charity fund raising, yearbook, as well as many other activities, would satisfy this requirement. Students are expected to complete a total of 150 hours over two years, which is evenly balanced among all three areas of creativity, activity and service. Students will be given a report at the end of each semester to



show their activities and hours. Failure to meet CAS requirements means that a student will **not** receive their IB Diploma.