Caring Risk-Takers Thinkers Communicators Inquirers Principled Knowledgeable Balanced Open-Minded Reflective

Building Bridges between Countries & Cultures

MEF

INTERNATIONAL SCHOOLS

MEF IS IZMIR

SECONDARY SCHOOL CURRICULUM GUIDE 2025-26

Grade 12 IBDP2

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MEF IS Motto

Building bridges between countries and cultures

MEF IS Mission

We inspire, nurture and challenge our learners to realise their unique potential.

MEF IS Vision

To be an open-minded community striving for creativity, innovation and excellence

MEF IS Learning Definition

Learning is the ongoing process of constructing new understandings of the world through experiences and interactions. It consists of making connections, reflecting, and expanding on current knowledge through motivation, curiosity, exploration, experimentation, and natural consequences resulting in change in the way we think and perform.

MEF IS Definition for Internationalism / Interculturalism

A dynamic discourse that fosters: knowledge and respect; the search for commonalities and a celebration of differences; international mindedness and a peaceful, ethical and progressive society.

MEF IS Guiding Principles

The MEF International School Community;

- promotes and cultivates global mindedness, developing an appreciation for individuals, groups, cultures and societies
- is empathetic, striving to understand and learn from the perspective of others
- uses reflective practice, striving for continuous improvement

Where learning…

- involves making connections, and extending the learner's understanding that results in action and change
- is experiential, fun, authentic, and collaborative
- engages learners in critical, analytical and creative thinking

Where teaching…

- depends on the positive relationship between teachers and learners
- supports individual learners, providing challenge and rigour
- allows for learner voice, choice and ownership
- fosters curiosity, exploration and experimentation
- integrates technology to enhance learning
- is innovative and creative, informed by research concerning educational practice

Table of Contents

The Roles of Learners and Teachers	4
Assessment	5
IB2 OVERVIEW	7
SELF-STUDY LANGUAGE A: LITERATURE	10
ENGLISH A: LANGUAGE & LITERATURE	12
ENGLISH B	15
FRENCH B	18
FRENCH AB INITIO	21
SPANISH B	25
SPANISH AB INITIO	29
HISTORY	33
ECONOMICS	37
BIOLOGY	42
CHEMISTRY	48
PHYSICS	54
MATHEMATICS APPLICATIONS & INTERPRETATION (SL)	63
MATHEMATICS ANALYSIS AND APPROACHES (SL)	67
MATHEMATICS ANALYSIS AND APPROACHES (HL)	71
THEORY OF KNOWLEDGE (TOK)	75

The Roles of Learners and Teachers

These roles reflect the MEFIS learning definition and are based on self-awareness and an understanding of the dynamic, transformative and life-long processes of learning and teaching. Both learners and teachers aim for impacts not just the assessment outcomes. Teachers and learners collaborate in a secure environment in order to develop their thinking, research, self-management, social and communication skills and become responsible and productive members of local, national and global communities.

Learners are	**Teachers are**
Confident in working with information and ideas using a variety of sources by analysing and reflecting on visuals and multimedia.	**Confident**, **knowledgeable** and visionary in teaching their subject and engaging each student in learning.
Responsible and principled for their own learning, making informed choices, and being responsive to and respectful of others both in and out of the classroom.	**Responsible** and **principled** for themselves being responsive to and respectful of all learners by supporting individual needs and providing challenge and rigour, both in and out of the classroom.
Reflective inquirers who realize that people learn in different ways, discovering how they learn best and developing strategies to be successful throughout the learning process.	**Reflective inquirers** as learners themselves, developing their practice and fostering curiosity, exploration and experimentation.
Innovative, resourceful and resilient **thinkers** and **risk-takers** who take initiative in applying prior knowledge to solve present and future challenges.	**Innovative risk-takers** equipped for present and future challenges, who integrate 21st century skills to enhance and transform learning and are informed by action research.
Engaged, balanced and open-minded intellectually and socially and ready to make a positive difference in local, national and global communities.	**Engaged**, **balanced thinkers** intellectually, professionally and socially, ready to make a positive difference in local, national and global communities.
Communicative and caring in understanding constructive feedback and expressing ideas creatively and collaboratively in more than one language and in many ways.	**Communicative and caring** allows for student voice, choice and ownership by promoting positive relationships and providing learners with constructive, timely feedback and strategic opportunities for using mother tongue for developing understandings.

Teaching and Learning

Teachers use a variety of methods to develop student knowledge, skills, understanding and dispositions. It is the responsibility of the student to be engaged, participate and follow instructions. The teacher should be notified if additional support is needed. Technology is used to support and enhance teaching and learning when appropriate. Students should bring fully charged laptops to lessons.

Google Classroom

Each course has a Google Classroom where students can see announcements, homework and deadlines and electronically submit assignments. Students will be invited to join a classroom by their teacher and are expected to check it regularly. Parents can keep track of their child's classroom progress through daily or weekly email summaries. Email summaries include updates on missing work and upcoming work. As a guardian, before you can receive email summaries, you must receive and accept an invitation from your student's teacher or school. If you have any questions, please contact the subject teacher via email.

Assessment

Assessment is used to inform both teachers and students in their teaching and learning. Teachers provide varied opportunities for students to participate in, and reflect on, the assessment of their work**.** Renweb is used to communicate formative and summative assessment outcomes for every student. Each subject is reported on at the end of the two semesters.

To calculate the overall achievement of a student each semester, the grades from different assessments have different weightings:

Summatives: 50%
Performance 1: 40% (essays, lab reports, projects, investigations, internal assessment)
Performance 2: 10% (Formative quizzes, homework, classwork)

Homework:	Homework is assigned regularly to reinforce classroom learning, promote independent practice, and develop self-management skills. Tasks may include problem sets, reflections, readings, research, or preparation for upcoming lessons. Homework is expected to be completed on time and with academic integrity, as it supports readiness for class discussions, formative assessments, and long-term projects. While not graded in the same way as summative assessments, homework provides valuable evidence of learning habits and helps students build the discipline and responsibility required for success in the IB program.
Classwork:	Classwork is an essential component of the learning process and provides opportunities for students to engage actively with concepts through discussions, problem-solving, collaborative tasks, and individual practice. Students are expected to participate meaningfully, remain focused, and contribute to a positive classroom environment. Classwork helps teachers monitor progress, provide feedback, and prepare students for formative and summative assessments, while also fostering ATL skills such as communication, collaboration, and critical thinking.
Formative Assessment	Formative assessments are integrated regularly into teaching and learning to provide students with timely feedback and guide their progress toward mastery of key concepts and skills. These assessments may include quizzes, class discussions, problem-solving tasks, digital tools, reflections, and short written or oral exercises. The purpose is not to assign grades but to identify strengths, address misconceptions, and support differentiated instruction. Formative assessments also help students develop self-management and reflection skills, preparing them for success in summative assessments and ultimately in IB examinations.
Summative Assessment	Summative assessments are communicated to students at least one week in advance to ensure fairness and adequate preparation time. These assessments are criterion-related and may include structured and/or open-ended tasks designed to evaluate student understanding across one or more topics or units. Summative tasks also incorporate IB past paper questions, with the use of past papers gradually increasing as students advance, to build familiarity with IB assessment style and expectations. These assessments provide opportunities for students to demonstrate conceptual understanding, application of knowledge, and critical thinking skills. Summative assessments are typically 30 minutes or longer in duration.

Internal Assessment (IA)	The Internal Assessment is a key component of every subject in the IB Diploma Programme. It allows students to demonstrate their learning through projects, investigations, or written work completed during the course, rather than only through final examinations. The IA encourages independent research, critical thinking, and the practical application of subject knowledge. Each IA is assessed by the subject teacher and then moderated by the International Baccalaureate Organization to ensure consistency and fairness worldwide. The Internal Assessment contributes a significant portion of the final IB grade and provides students with an opportunity to explore areas of personal interest while building important academic skills.

Approaches to Learning (ATLs)

Approaches to Learning (ATLs) are not included in the calculation of academic grades. However, teachers provide feedback on report cards indicating whether each student is meeting the specific ATL skills, offering insight into their development of critical thinking, communication, research, self-management, and social skills.

Balanced Study and Extracurricular Engagement

Grade 12 IB students are expected to dedicate time each week to independent study, homework, and assessment preparation, typically around 12–15 hours outside of school. Equally important is maintaining a healthy balance with extracurricular activities, personal interests, and rest. Engaging in sports, clubs, arts, and community service supports well-rounded development, helps manage stress, and enhances skills such as time management, collaboration, and resilience. Effective learning occurs when study time is purposeful and complemented by activities that foster personal growth and well-being, ensuring students remain motivated, focused, and prepared for the demands of the IB programme.

IB Grades vs MEF Grades

When IB past papers are used for assessment, teachers apply the official IB mark schemes to scale the results. This ensures that student performance is evaluated against the same standards used in formal IB examinations, providing a fair and accurate reflection of progress before grades are recorded in RenWeb.
MEF grades, recorded in RenWeb, reflect this scaled performance while also considering ongoing coursework, class participation, and formative assessments. This approach provides a comprehensive view of student learning, aligning internal tracking with IB standards and helping students understand their progress relative to both classroom expectations and external IB benchmarks.

Student Support

Learning support and counselling is available to all students in need. Students needing support from individual subjects should discuss this with their teachers.

Attendance

Consistent and punctual attendance is important for all students' learning. If students know they plan to miss school, they should complete the student missing worksheet before they leave. Students returning from missing school have the responsibility to catch up on this missed work themselves. Students missing exams are only eligible to take these other dates with Deputy Principal/Academic Dean's permission. This is granted if the student can provide a doctor's note or other official documentation.

Semester Examinations

The academic year is organized into two semesters, each culminating in a semester examination. These examinations constitute a key component of the school's summative assessment framework, providing students with an opportunity to demonstrate their knowledge, understanding, and application of concepts taught across multiple chapters or units. For Semester 2, the mock examination will serve as the official semester examination, and its results will be counted toward the summative assessment. The mock exam is designed to simulate the official examination experience, helping students become familiar with the

format, timing, and expectations of International Baccalaureate (IB) assessments. To maintain authenticity and rigor, the assessment will be based purely on IB past papers. This approach not only prepares students for formal examinations but also supports the development of higher-order thinking skills and effective exam strategies.

Exam dates:
Semester 1: Dec 8-12, 2026
Semester 2(Mock Exams): March 23-April 1, 2026
Official IB Exams: April 27- May 20, 2026

IB2 OVERVIEW

Course of study

The IB2 Diploma course is designed as the second of a 2 year course of study culminating in the IB (International Baccalaureate) Diploma programme, an internationally recognised qualification. Students study a first language course in English, Turkish or in a self-taught course in their mother tongue; English, French or Spanish as an additional language; ITGS or Economics; Biology or Physics; Mathematics; Chemistry, ITGS (Information Technology in a Global Society) or Visual Arts; and TOK (Theory of Knowledge).

3 courses are studied at standard level (SL) and 3 courses are studied at higher level (HL). These are syllabus-based courses detailing international learning objectives over a 2 year period culminating in externally written and graded examinations and externally moderated assessments during the two years.

Alongside these subjects, students take part in CAS (Creativity, Activity and Service) and write a research-based 'Extended Essay' in one of the 6 subjects. Further information about the International Baccalaureate can be found on their website http://www.ibo.org/ . "Course Aims & Objectives" listed throughout the document have been taken from IB course guides.

Group 1 (Language A)	Group 2 (Language B)
English A (SL, HL) Self-Study A (SL) *Course certificate students may take English B in group 1	English B (SL, HL) French B (SL, HL), Spanish B (SL, HL) Spanish Ab Initio (SL,. French Ab Initio (SL)
Group 3 (Individuals and Societies)	Group 4 (Experimental Sciences)
History (SL HL) Chemistry (SL , HL)	Biology (SL, HL) Physics (SL, HL)
Group 5 (Mathematics)	Group 6 (Arts and Electives)
Mathematics Analysis and Approaches (SL, HL) Mathematical Applications and Interpretation (SL)	Economics (SL, HL)

Students who do not wish to undertake the full IB Diploma Programme, or who do not meet the entrance requirements, have the option of enrolling in the **IB Course Certificate Programme**.

In this pathway, students take IB courses in English, Mathematics, French or Spanish, Science or Humanities, and a Group 6 elective. They may also choose to sit for externally assessed IB examinations in these subjects and, if successful, will be awarded an official IB certificate for each course.

To be eligible to receive the **Turkish High School Diploma**, IB Course Certificate students must complete at least five courses, including both English and Mathematics.

IB Learner Profile

The IB Diploma Programme is committed to the development of students according to the IB learner profile.

The learner profile aims to develop learners who are

- Inquirers
- Knowledgeable
- Thinkers
- Communicators
- Principled
- Open-minded
- Caring
- Risk-takers
- Balanced
- Reflective

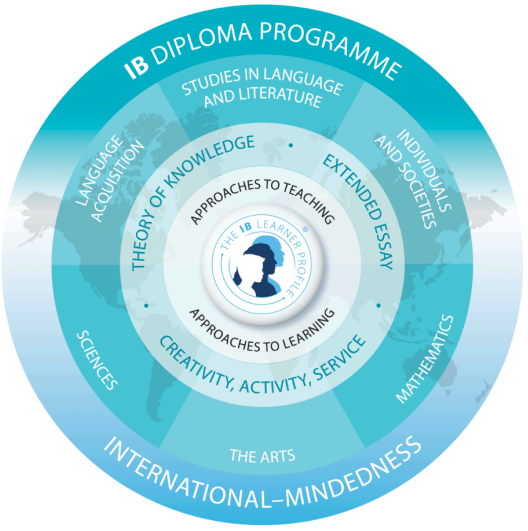

Figure 1
Diploma Programme model

IB Progress Reports

IB Progress Reports are issued periodically to communicate student progress according to IB standards in individual IB courses during specific time intervals. These grades may be different from what is seen in RenWeb. The grades reflect how students would perform on official IB exams. These reports are unofficial and have no bearing on student transcripts. They do not represent the final predicted grades that teachers submit for university admission applications.

Progress Report grades follow the IB grading system 7-1 for academic subjects and A-E for Extended Essay and TOK. Comments follow the IBDP Grade Descriptors guidance for each group of subjects. Scores of "3" or lower are considered unsatisfactory and may result in a student probation. For students in the full Diploma Programme, an unsatisfactory score on a progress report combined with a failing grade at the end of the first semester may demote a student to the IB Course Certificate Programme.

IB Predicted Grades (March of IB2)

The predicted grade is the teacher's prediction of the grade the candidate is expected to achieve in the subject, based on all the evidence of the candidate's work on components assessed by the IB and the teacher's knowledge of IB standards. Predicted grades might not match RenWeb grades as they do not include homework and other assignments. Predicted grades are also required for theory of knowledge and the extended essay. It is important that each prediction is made as accurately as possible, without under-predicting or over-predicting the grade. The IB takes measures to work with schools that consistently under- or over-predict student grades.

IB Diploma Requirements

- CAS requirements have been met.
- The candidate's total points are 24 or more.
- There is no "N" awarded for theory of knowledge, the extended essay or for a contributing subject.
- There is no grade E awarded for theory of knowledge and/or the extended essay.
- There is no grade 1 awarded in a subject/level.
- There are no more than two grade 2s awarded (HL or SL).
- There are no more than three grade 3s or below awarded (HL or SL).
- The candidate has gained 12 points or more on HL subjects
- The candidate has gained 9 points or more on SL subjects
- The candidate has not received a penalty for academic misconduct from the Final Award Committee.

		Theory of knowledge					
		Grade **A**	Grade **B**	Grade **C**	Grade **D**	Grade **E**	No grade **N**
Extended essay	Grade **A**	3	3	2	2	Failing condition	Failing condition
	Grade **B**	3	2	2	1	Failing condition	Failing condition
	Grade **C**	2	2	1	0	Failing condition	Failing condition
	Grade **D**	2	1	0	0	Failing condition	Failing condition
	Grade **E**	Failing condition	Failing condition	Failing condition	Failing condition	Failing condition	Failing condition
	No grade **N**	Failing condition	Failing condition	Failing condition	Failing condition	Failing condition	Failing condition

This curriculum guide has been produced in collaboration with all teachers. Please note that there may be changes to the details as students learn at different rates. It may be necessary to take longer on a unit, or go through a unit faster than anticipated.

SELF-STUDY LANGUAGE A: LITERATURE

Teacher(s): Sandy Safi

Email: safis@mefis.k12.tr

Course Description:

This year of the course is focused on in-depth literary analysis with particular attention to the conventions of a chosen genre and the writer's use of language in preparation for their oral exams as well as their written exams. There is also a review of the previous year as students move toward their final exams.

This course is classified as self-study; students are responsible for their own learning objectives with the help of outside tutors. The teacher will meet with the students once a week to help them stay on track.

IB Progress Reports are written based on tutor and teacher feedback.

Course Aims & Objectives:

- Develop in students an understanding of how language, culture and context determine the ways in which meaning is constructed in texts.
- Encourage students to think critically about the different interactions between text, audience and purpose.
- 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 in 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.

Enduring understandings:

- Literature is an opportunity to explore life and experiences from a different perspective.
- The study of literature is a cross-curricular discipline.
- Literature both shapes and reflects the culture in which it was created.
- The contexts of reception and production shape the meaning and content.
- Enduring themes and character studies connect the texts read.
- The purpose of a text determines its style and meaning.
- Knowledge of stylistic techniques enriches our interaction with a text.
- The purpose of a text determines its style and meaning.
- Texts are open to multiple interpretations by their audiences.

UNIT 1: IOC review	
Timeframe	4weeks
Learning goals:	● To examine literature critically ● To create a presentation regarding 2 texts of 10 minutes including visuals
Assessments	NOT APPLICABLE (Self-Study. Progress Reports are written based on buth tutor and teacher feedback of the student's self-study practices)
TOK	Students individually make TOK links within their IOC review by considering how Global Issues are linked to their chosen texts

UNIT 2: IOC preparations	
Timeframe	9 weeks
Learning goals:	● To examine literature critically ● To pair passages from texts with the questions regarding drama and poetry ● To choose random questions and have students respond to the question with their passage in 10 minutes. ● Practise analytical skills in English with a variety of passages from prose-non-fiction/fiction and poetry (IGCSE)
Assessments:	NOT APPLICABLE (Self-Study. Progress Reports are written based on buth tutor and teacher feedback of the student's self-study practices)
TOK	Students individually make TOK links within their IOC preparation by considering how Global Issues are linked to their chosen texts

UNIT 3: Paper 1 & 2 Preparation	
Timeframe	16 weeks
Learning goals:	● Practise literary analysis skills ● Read and examine 3 texts in depth ● Review essay writing skills ● Review texts for Papers 1 & 2 ● Write practise Paper 2 essays
Assessments	NOT APPLICABLE (Self-Study. Progress Reports are written based on both tutor and teacher feedback of the student's self-study practices)
TOK	Students individually make TOK links when preparing for Paper 1 & Paper 2

ENGLISH A: LANGUAGE & LITERATURE

Teacher(s): James Dittes

Email: dittesj@mefis.k12.tr

Course Description:

This year of the course is focused on in-depth literary analysis with particular attention to the conventions of a chosen genre and the writer's use of language. The class will also examine how language and mass communication are related and further develop the ability to critically evaluate texts. There is also a review of the previous year as students move toward their final exams.

Course Aims & Objectives:

- Develop in students an understanding of how language, culture and context determine the ways in which meaning is constructed in texts.
- Encourage students to think critically about the different interactions between text, audience and purpose.
- 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 in 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.

Enduring understandings:

- Literature is an opportunity to explore life and experiences from a different perspective.
- The study of literature is a cross-curricular discipline.
- Being able to decode and deconstruct media is essential in life.
- News companies aim their content at different audiences.
- Rhetorical knowledge is key to any successful election, social movement, or marketing company.
- Literature both shapes and reflects the culture in which it was created.
- Power often has a negative effect on people.
- The contexts of reception and production shape the meaning and content.
- Enduring themes and character studies connect the texts read.
- The purpose of a text determines its style and meaning.
- Knowledge of stylistic techniques enriches our interaction with a text.
- The purpose of a text determines its style and meaning.
- Texts are open to multiple interpretations by their audiences.

UNIT 1: *The Awakening* by Kate Chopin	
Timeframe	5 weeks
Learning goals:	● To discuss nineteenth-century social attitudes toward women, children, and family. ● To identify and distinguish among the types of women presented in the novel. ● To collect and organise evidence from texts to support analysis in discussion ● To be able to analyse and critique the text's themes, characterisation, language and overall narration ● Analyse Edna Pontellier's character development specifically in relation to other characters in the novella and generally in relation to women's roles in 19th-century America ● To consider the reception of this text by different readers, different interest groups and at different times and places ● To apply a conceptual focus to *The Awakening* and *The World's Wife* and establish similarities and differences between them. ● To be able to write an academic essay based on the text
Assessments:	Responding to a given essay prompt UbD Performance Task 1 Fishbowl Discussion
TOK	● Discuss the concepts of emotion and reason as ways of knowing. ● Students will reflect on how Edna's emotional journey in the novel contrasts with the rational expectations of society. ● Students will share their insights on how Edna's emotions and reasoning affect her decisions and ultimate awakening. ● Explore the ethical dilemmas faced by characters in the novel. ● Discuss the different moral perspectives within the story.

UNIT 2: *The World's Wife* by Carol Ann Duffy and HLE Intro	
Timeframe	8 weeks
Learning goals:	● Intro to HLE ● Demonstrate knowledge and understanding of one of the bodies of work. ● Apply relevant methods for text analysis, drawing on linguistic and literary techniques. ● Explore how linguistic and literary approaches can inform interpretations of texts. ● Identify how meanings and effects are created and conveyed in texts. ● Analyse the ways in which a poetry text draws on its literary, cultural and stylistic contexts. ● To consider the reception of this text by different readers, different interest groups and at different times and places ● To be able to write an academic essay based on the text ● **Transdisciplinary Links: History/Art: Gender equality**
Assessments:	Evaluation of different lines of inquiry Creating concept questions Assessing suitability of lines of inquiry and drafting a proposal and/or thesis to prepare for HLE Exam 1
TOK	Examine the cultural and historical contexts that appear in the poems. ● Discuss how knowledge of the historical and cultural context enhances the understanding of the poems. ● Explore the role of emotion and artistic expression as ways of knowing in the poems.

	● Encourage students to identify instances where emotion and creativity are evident in the poems. ● Discuss how emotional responses to the poems shape one's interpretation.

UNIT 3: *Hamlet* by William Shakespeare (HL Students)	
Timeframe	5 weeks
Learning goals:	● To understand the context of the play ● To understand and use a variety of performance strategies ● To direct and present a key scene from the play ● To be able to identify and analyse the author's use of literary devices ● To analyse the text in terms of language, themes, characterisation, and structure. ● To move from making isolated comments on the text to forming a coherent and sustained academic argument. ● To write an academic essay as part of IB assessment requirements ● **Transdisciplinary Links:** Gender Studies, Society, and Historical Context.
Assessments	Evaluation of different lines of inquiry Creating concept questions HL essay
TOK	● Students will analyse the play from the assigned character's perspective. What do they know, believe, and feel? How do their perspectives influence their actions and interactions? ● Students will reflect on how their own ethical beliefs might differ from those of the characters and how this influences their interpretation.

UNIT 4: Exam preparation	
Timeframe	5-6 weeks
Learning goals:	● Analyse the way any text is constructed to suit a particular purpose and audience ● Make astute comparisons between two literary texts ● Deconstruct essay questions ● Plan an essay according to set grading criteria
Assessments	Exam 2 IB paper 1 and 2 Mock Exam

ENGLISH B

Teacher(s): Chelsea Chin

Contact details: chinc@mefis.k12.tr

Course Description:

During this final year of the English B course, students will complete all internal and external exams. Three units will compose the course including a first on human ingenuity, second on sharing the planet, and third for revision/exam preparation. Students will develop listening, speaking, reading, and writing skills for interacting with a range of authentic and cultivated scenarios. They will study fiction and non-fiction works with importance placed on clarifying the audience, context, purpose, meaning, and variation of each piece.

Course Aims & Objectives:

- Communicate clearly and effectively in a range of situations, demonstrating linguistic competence and intercultural understanding
- Use language appropriate to a range of interpersonal and/or cultural contexts
- Understand and use language to express and respond to a range of ideas with accuracy and fluency
- Organize ideas on a range of topics in a clear, coherent and convincing manner
- Understand, analyse and respond to a range of written and spoken texts
- Understand and use works of literature written in the target language of study

Enduring understandings:

- Students will understand that the context we are in determines the language and register which will be most effective.
- Students will understand that other cultural perspectives enrich our experience of the world.
- Students will understand that cultures are lively, multifaceted and interact with one another to enrich our world.
- Students will understand the ability of language to guide or manipulate thought.
- Students will understand that their culture and languages share many similarities with others.
- Students will understand that knowing another language holds many personal and professional advantages.

UNIT 1: Human Ingenuity (Communication and Media, Scientific Innovation, Technology)	
Timeframe	12 weeks
Learning goals:	Students will be able to: ● Explore the ways in which human creativity and innovation affect our world ● Interpret a variety of texts types, particularly the book Feed ● Understanding the conventions of comprehension Paper 2 exams ● Analyze documents and reinterpret events based on evidence
Assessments	Homework and classroom written assignments Performance Task / Project Exam 1 In-class Presentations IB Interactive Orals

TOK	Students will consider the following questions: ● How do developments in science and technology influence our lives? ● How do the arts help us understand the world? ● What can we learn about a culture through its artistic expression? ● How do the media change the way we relate to each other?

UNIT 2: Sharing the Planet (Human Rights, Environment, Globalization, Ethics)	
Timeframe	12 weeks
Learning goals:	Students will be able to: ● Respond appropriately to visual and written prompts with descriptive and analytical skills ● Consider global issues from a variety of perspectives with reference to historical and geopolitical factors ● Read, write, listen, and speak in accordance with contexts provided, particularly texts The Help and Born a Crime ● Integration of clips regarding course content, such as apartheid
Assessments	Homework and classroom written assignments Performance Task / Project Exam 2 In-class Presentations IB Individual Oral Exam
TOK	Students will consider the following questions: ● What environmental and social issues present challenges to the world, and how can these challenges be overcome? ● What ethical issues arise from living in the modern world, and how do we resolve them? ● What challenges and benefits does globalization bring? ● What challenges and benefits result from changes in urban and rural environments?

UNIT 3: Revision and Exam Preparation (Papers 1 and 2)	
Timeframe	5 weeks
Learning goals:	Students will be able to: ● Comprehend, explain, and interpret a range of texts such mass media productions, personal writing, and professional works ● Examine how audience, context, purpose, meaning, and variation play a role in various pieces of literature ● Practice skills needed for IB Papers 1 and 2
Assessments:	Homework and classroom written assignments Performance Task / Project In-class Presentations Reading Comprehension Paper 2 Exam

TOK	Students will consider the following questions: ● To what extent does language shape our perception of the world and our understanding of our own identities? ● What is the individual's role in the community? ● What ethical issues arise from living in the modern world, and how do we resolve them?

FRENCH B

Teacher(s): Sandy Safi

Email: safis@mefis.k12.tr

Course Description:

During this final year of the French B course, students will complete all internal and external assessments. The first semester will center around a unit on media and communication. Next, HL* students will study the novel *Oscar et la dame rose* by Éric-Emmanuel Schmitt. In semester 2, students will focus on the preparation of their spring external exams and their individual oral.

Course Aims & Objectives:

- Communicate clearly and effectively in a range of situations, demonstrating linguistic competence and intercultural understanding
- Use language appropriate to a range of interpersonal and/or cultural contexts
- Understand and use language to express and respond to a range of ideas with accuracy and fluency
- Organize ideas on a range of topics in a clear, coherent and convincing manner
- Understand, analyse and respond to a range of written and spoken texts
- Understand and use works of literature written in the target language of study

Enduring understandings:

- ❏ Students will understand the ability of language to guide or manipulate
- ❏ Students will develop international-mindedness through the study of languages, cultures, and ideas and issues of global significance.
- ❏ Students will learn to communicate in a range of contexts and for a variety of purposes
- ❏ Students will understand that the study of texts and social interaction can develop an awareness and appreciation of a variety of perspectives of people from diverse cultures.
- ❏ Students will develop an awareness of the importance of language in relation to other areas of knowledge.
- ❏ Students will foster curiosity, creativity and a lifelong enjoyment of language learning

UNIT 1 : Revision of IB1 topics (identities, experiences) + Human Ingenuity	
Timeframe	6 weeks
Learning goals:	● To talk about the role of TV in our lives ● To discuss how mobile phones affect our ability to communicate ● To analyse the role of other new technologies on our daily lives ● To explore the world of advertising and propaganda
TOK	The IB program aspires to develop lifelong learners who will thrive and make a difference in the world. Knowing this, consider this question: Does our education have an impact on our values? Who sets the standards? Are there standards superior to others? What defines our values What are the values defended? Do they seem to you to belong to lower cultures? Do they seem different to you from the standards you know? For what? **Activity** : Topics will be answered through presentations, short videos and discussion in class. For example : Giving different sentences in French and ask students which sentences are more favourable or unfavourable to politically correct language.
Assessments	Quizzes / Interactive oral /Performance task /Project

UNIT 2 : Organisation sociale + Education	
Timeframe	6 weeks
Learning goals:	● To talk about how we can change our habits ● To discuss human rights around the world ● To discuss the impacts of global poverty ● To talk about war and peace ● To talk about globalisation
TOK	Why can a person with a positive attitude change our perspective? Do you think attitude is something that can be passed on the others? Many citizens are fighting for causes that are often the source of very divergent opinions. What is considered as social progress by some (homosexual marriage, right to abortion, to contraception..) is considered by others as an attack on the integrity of a society, what criteria could we use to determine whether a cause is just of not? Whether it is a choice of an obligation, education is at the centre of our lives. At school. We acquire a certain amount of knowledge. To what extent is what we learn in school essential to our adaptation to the world in which we live? What characterises the work? **Activity** : students research in groups and share their ideas in the form of presentations on the following themes like : what types of knowledge does the school make it possible to acquire? And are there other types of knowledge that are not acquired in school? Topics will be answered through presentations, role play and discussion in class.
Assessments	Quizzes / Written assignments / Project / Homework / Performance Task / Exam 1

UNIT 3 : IB French B Text types + Experience	
Timeframe	7 weeks
Learning goals:	● To understand the differences between different text types ● To choose the right text type and make a plan for the writing ● To draft, re-draft and complete the written assignment (Paper1)
TOK	What determines the nature of rites of passage? At what age is majority set in your country? At what age can you vote? Get married, be responsible for your actions, be elected? What factors determine these ages and are they different? In your opinion, should certain traditional rites of passage be prohibited by law? **Activity** : Topics will be answered through presentations, and discussion or reading in class. For example : after reading the article:"stories of lost objects : Maurices's notebook" wonder about the role of memory. Students answer questions about the importance of individual and collective memory, and share their opinions in class.
Assessments	Quizzes / Project / Written production / Homework / Classwork

UNIT 4 : Partage de la planète + Paper1 & Paper2 revision + Text types revision + past paper practice	
Timeframe	10weeks
Learning goals:	● To discuss the pollution, energy types,ecology ● To talk about environmental issues ● To review the areas where students struggle the most and to discuss strategies and tips to further improve ● To review key grammar points ● To review key vocabulary for both the options and core topics ● To practise challenging exam activities for the reading paper (Paper 1) ● To review written tasks (paper 2) criteria and requirements ● To practise argumentative text writing for HL students (section B, Paper 2)
TOK	Caring about the environment and taking action involves choosing between several priorities. How does your education help you make choices? Or what is urgent and important, where Should you start? (Think of world hunger and global warming) To what extent are our decisions based on emotion rather than reason? By what criteria do we determine the moral sense of a person? What influences the moral judgements we make about the past? Are scientists morally responsible for how their discoveries are used? **Activity** : Topics will be answered through powerpoint presentations, and discussion in class. For example : on the subject of euthanasia, ask the students to do research on this controversial topic. Give them a list of vocabulary and expressions that relate to that theme and ask them to say which words/expressions have a positive connotation and which have a negative connotation?
Assessments	Exam / Quizzes / Project / Performance task / Homework / Classwork/ May: Official IB exams

FRENCH AB INITIO

Teacher(s): Sandy Safi

Email: safis@mefis.k12.tr

Course Description:

The ab Initio French course for beginners is followed over two years. The main focus of the course is the acquisition of language required for purposes and situations usual in everyday social interactions. The ab initio French course provides a solid grammar and vocabulary framework and is organized into five themes made up of a series of twenty topics. The five themes are:

- Identities
- Experiences
- Human ingenuity
- Social organization
- Sharing the planet

Course Aims & Objectives:

At the end of the ab initio course, students will be expected to demonstrate an ability to:

- communicate information and some basic ideas clearly and effectively in a limited range of situations,
- understand and use accurately the essential spoken and written forms of the language in a limited range of situations,
- understand and use a limited range of vocabulary in common usage,
- use a register that is generally appropriate to the situation,
- show an awareness of some elements of the culture of the target language.

Enduring understandings:

- Students will understand the ability of language to guide or manipulate.
- Students will develop international-mindedness through the study of languages, cultures, and ideas and issues of global significance.
- Students will learn to communicate in a range of contexts and for a variety of purposes.
- Students will understand that the study of texts and social interaction can develop an awareness and appreciation of a variety of perspectives of people from diverse cultures.
- Students will develop an awareness of the importance of language in relation to other areas of knowledge.
- Students will foster curiosity, creativity and a lifelong enjoyment of language learning.

UNIT 1: Review: reading, writing and IA	
Timeframe	4 weeks
Learning goals:	To revise different types of text- IN expectations about the texts: ● Different types of texts (Paper 2) ● Advertisement ● Article ● Blog ● Email ● Brochure Entry/post on social networking site ● Diary ● Invitation ● Message/note ● Interview ● Notice Letters: formal/ informal ● Postcard ● Poster ● Lettre formelle ● Lettre informelle ● Journal intime ● Article du journal ● Interview ● Brochure ● Forum **TOK: General discussion: round table: How does language allow us to pool resources and share knowledge ?** **Reading activity: Is it possible to think or know without language?**
Assessments	Homework and quizzes Interactive oral activities Exam 1 Project 1 (picture)

UNIT 2: Human ingenuity: media and technologies	
Timeframe	6 weeks
Learning goals:	● To understand the different artistic styles ● To discuss literature and cinema ● To talk about music and theater ● To understand different festivals in the francophone world ● Environmental technology ● To analyze and discuss the advantages and disadvantages of the internet ● To Talk about the role of ICT in schools ● To review the positives and negatives of social media ● To examine virtual relationships ● To discuss gaming ● To discuss the different aspects related to the technology and respectful with the environment ● Transgenic foods and genetic manipulation ● To reflect on the positive and negative aspects of GM foods and genetic manipulation

	● To discuss the different projects aimed at space exploration ● The role of science and technology in our lives ● To discuss the positive and negative aspects of advances in technology and science **TOK: General discussion: round table: To what extent is knowledge dependent on the categories we use?**
Assessments	Homework and quizzes Interactive oral activities Project 2 (picture)

UNIT 3: Review: Experiences (working environment)	
Timeframe	5 weeks
Learning goals:	● Expressing positive and negative aspects of a work ● Talking about important characters and their lives ● Giving and understanding information about experience of work ● Talking about daily habits to carry a healthy life ● Giving advice and expressing obligation ● Knowledge of report, radio program, bio data, biography, overview, curriculum, podcasts, email, legal article ● Describing a picture: to practice describing a picture, connecting it to a theme. ● To talk about wellness and routine **TOK: General discussion: round table: In what ways do values affect our representations of the world, for example, in language, maps or visual images?** **How do we know that some leaders have made a fair, social impact in the world? (fairness, politics.)**
Assessments	Homework and quizzes Interactive oral activities Performance task 1 (oral practice)

UNIT 4: Review: Experiences & Identities	
Timeframe	3 weeks
Learning goals:	● To discuss immigration & unemployment ● To learn related vocabularies ● To talk about our identities **TOK: General discussion: round table: Is ethical language meaningless? How does the concept of beauty change according to the culture?**
Assessments	Homework and quizzes Interactive oral activities Project 3 (oral practice/assignment)

UNIT 5: Sharing the Planet	
Timeframe	4 weeks
Learning goals:	• To understand texts on natural catastrophes • To analyse and discuss climate change • To talk about endangered species • To discuss our role with helping the planet **TOK: General discussion: round table: To what extent is it possible or desirable, to overcome ambiguity in language ? Do developed countries have a moral obligation to provide humanitarian aid to developing countries?**
Assessments	Homework and quizzes Interactive oral activities Exam 2 Project 4

UNIT 6: IA practice	
Timeframe	3 weeks
Learning goals:	• Describing a photo • Analysing and answering questions about a photo • Engaging in a conversation **TOK: General discussion: round table: How might language be seen hinder knowledge?**
Assessments	Homework and quizzes Interactive oral activities Project 5 (Past papers)

UNIT 7: Exam preparation	
Time frame	4 weeks
Learning goals:	• To review the areas where students struggle the most and to discuss strategies and tips to further improve • To review key grammar points and vocabulary • To practice challenging exam activities for the reading paper and listening (Paper 2) • To further practice key vocabulary and reading and comprehension techniques. • To review written tasks (paper 1) criteria and requirements **TOK: General discussion: round table: In what ways can language be used to influence, persuade or manipulate people's emotions?**
Assessments	Homework and quizzes Interactive oral activities Project 6 (Past papers)

SPANISH B

Teacher(s): Terry Baudilio Anzueto

Contact details: anzuetot@mefis.k12.tr

Course Description:

During this final year of the Spanish B course, students will complete all internal and external assessments. The units will center on areas related to identities, experiences, human ingenuity, social organization and sharing the planet. The class will focus on different forms of writing and text features by investigating pieces of writing from the media, books, magazines and the internet. Students will also complete activities and coursework in preparation for the official IB examinations.

Course Aims & Objectives:

- Communicate clearly and effectively in a range of situations, demonstrating linguistic competence and intercultural understanding
- Use language appropriate to a range of interpersonal and/or cultural contexts
- Understand and use language to express and respond to a range of ideas with accuracy and fluency
- Organize ideas on a range of topics in a clear, coherent and convincing manner
- Understand, analyse and respond to a range of written and spoken texts
- Understand and use works of literature written in the target language of study

Enduring understandings:

- Students will understand that learning a language can enhance their life.
- Students will identify that they can use their existing language learning skills to learn another language.
- Students will understand that some mistakes are worth making in order to communicate when learning another language.
- Students will identify that there are cultural similarities and differences between their own culture and the target language.
  Students will learn to use pronunciation to sound more like a native speaker of another language.
- Students will learn that we don't have to translate everything in order to comprehend a new language.

UNIT 1: IDENTITIES: ¿Quién soy Yo?	
Timeframe	6 weeks
Learning goals:	**Who am I?** ● Reflect on how we express our identity. ● Comment on how language and culture contribute to shaping our identity. ● Go over the study guide and prepare for exam 1.
Theory of Knowledge TOK	● Do you think that the nationality, culture, traditions, clothing, or language you speak determines your identity or what you think? Why not)? ● Would you be different if they belonged to another culture? In what aspects?

	• What aspects do you think your way of being and seeing the world is most related to? • What aspects define your current identity? Activity: Preserving cultural identity Learn to use direct and indirect object pronouns to avoid repeating expressions and becoming anaphoras. This resource is widely used in press articles in Spanish to avoid repeating the exact words, especially in short texts. Still, sometimes it is abused and can lead to unnecessarily complicated texts. Is it used the same in your mother tongue? Look for articles on the same topic in Spanish and your language, and see if the same resources are used to avoid repetitions of the same word.
Assessments	On-going assessment through class work. Homework assignments. Quizzes. Performance task.

UNIT 2: EXPERIENCES: Historia para el futuro.	
Timeframe	6 weeks
Learning goals:	**History for the future** • Explore life stories and rites of passage. • Discuss social changes. • Reflect on aspects related to customs and traditions. • Investigate the issue of migration. • Go over the study guide and prepare for exam 1.
Theory of Knowledge TOK	• What can we learn from history? • Are ceremonies and celebrations necessary? • Are changes in society significant? • What consequences does immigration have for migrants? • What consequences does immigration have for the society that welcomes them? • Is emigration always beneficial? Activity: Are ceremonies and celebrations necessary? Case: La Quinceañera In small groups, design a community project to throw a special someone a birthday party, quinceañera, or other surprise celebration of their dreams. What project could you create to get or reuse everything you need to make this person's dreams come true (objects, places, etc.)? After preparing your projects, present them to the rest of the class. Which group has had the most original ideas? And the most viable?
Assessments	On-going assessment through class work. Homework assignments. Quizzes. Project. Midterm Exam

UNIT 3: HUMAN INGENUITY: Ciencia y Tecnología.	
Timeframe	6 weeks
Learning goals:	**Science and Technology** ● Reflect on how we use science and technology. ● Explore how technology influences our quality of life and our social relationships. ● Talk about the positive and negative aspects of scientific and technological advances. ● Discuss the possible consequences derived from having access or not to new scientific and technological advances. ● Explore different technological and scientific initiatives.
Theory of Knowledge TOK	● Do advances in science and technology bring ethical dilemmas? ● Who is responsible for supervising and authorizing technological innovations? ● What can citizens do to avoid being entirely controlled by science and technology? ● Do you think there can be a world where people deny technology and go back to their origins? Activity: Can we live without technology? Imagine the government suddenly bans new technologies for reasons they do not want to reveal. Write an entry on your blog explaining what a day in your life is like without new technologies and in what aspects you miss them. You can discuss different factors such as your social life, academic life, leisure activities, etc.
Assessments	On-going assessment through class work. Homework assignments. Quizzes. Performance task.

UNIT 4: SOCIAL ORGANIZATION: Derechos y deberes	
Timeframe	6 weeks
Learning goals:	**Rights and Duties** ● Talk about work and education ● Talk about Laboral issues. ● Give your opinion on the importance of laws, human rights and justice. ● Describe different educational contexts. ● Discuss what opportunities and challenges the 21st century holds for us in the workplace and education. ● Discuss what aspects of the legal system we would change.
Theory of Knowledge TOK	● Why do you think false information appears on the internet? What consequences do you think this could have? ● Is it essential to check where the information you receive comes from? Do you? ● What can prevent false information from spreading on the internet and social networks? Activity: "Changing the world is not a utopia, but justice." What do you think of the phrase? On the internet, on several pages, it is said that this phrase belongs to Don Quijote, the character of Miguel de Cervantes. Is it true? Do research to find out.

	Discussion on justice: Why is the image of justice presented with a blindfolded woman? What does the phrase “blind justice” mean? Can you imagine any injustice that has been committed in your circle of family or friends? And in your city or country? How was it resolved? Would you like to change any laws? Would you like to legalize something not legal in your country right now? What? Why?
Assessments:	On-going assessment through class work. Homework assignments. Quizzes. Project.

UNIT 5 Annexed: SHARING THE PLANET: Nuestra huella en el mundo	
Timeframe	5 weeks
Learning goals:	**Our footprint in the world** ● Analyze what problems and benefits globalization brings. ● Investigate some of the challenges and opportunities facing individuals and communities today related to peace and conflict, equality and human rights. ● Explore various ethical problems that arise in modern society and how they can be solved. ● Go over the study guide and prepare for exam 4.
Theory of Knowledge TOK	● Can we make globalization only positive? ● How can all human rights be guaranteed? ● What needs to change so that there is equality in all social spheres? ● Could the world function without conflict? Activity: Gender equality Inequality and the fight for equality of all people in all spheres (work, family, education, rights, politics, legislation, etc.) is a topic that always hogs the news. The bullets can be a way to comment on these aspects visually, concisely, and very effectively, thus referring to these issues to create debate. Collect some bullet points to share in class. Then together, create an exhibition on the classroom walls and select the most exciting cartoons.
Assessments:	On-going assessment through class work. Homework assignments. Quizzes. Exam 2

SPANISH AB INITIO

Teacher(s): Terry Baudilio Anzueto

Contact details: anzuetot@mefis.k12.tr

Course Description:

The Ab Initio Spanish course for beginners is followed over two years. The main focus of the course is on the acquisition of language required for purposes and situations usual in everyday social interactions. The Ab Initio Spanish course provides a solid grammar and vocabulary framework and is organized into five themes made up of a series of twenty topics. The five themes are:

- Experiences
- Sharing the planet
- Human ingenuity
- Social organisation
- Identities

Course Aims & Objectives:

At the end of the Ab Initio course, students will be expected to demonstrate an ability to:

- demonstrate an awareness and understanding of the intercultural elements related to the prescribed topics
- communicate clearly and effectively in a range of situations
- understand and use accurately the basic structures of the language
- understand and use an appropriate range of vocabulary
- use a register and a format that are appropriate to the situation.

Enduring understandings:

- Students will understand the ability of language to guide or manipulate
- Students will develop international-mindedness through the study of languages, cultures, and ideas and issues of global significance.
- Students will learn to communicate in a range of contexts and for a variety of purposes
- Students will understand that the study of texts and social interaction can develop an awareness and appreciation of a variety of perspectives of people from diverse cultures.
- Students will develop an awareness of the importance of language in relation to other areas of knowledge.
- Students will foster curiosity, creativity and a lifelong enjoyment of language learning

UNIT 1: Education, Consumption, and Work	
Timeframe	10 weeks
Learning goals:	● Exchange views on education systems and changes in education ● Expressing obligation ● Interpret information oral and visual (using of Gerund and verbal periphrases) ● Talk about shopping (using possessives) ● Give opinions about shopping places, items, articles ● Personal pronouns (direct and indirect object forms) ● Writing a comment in an interactive portal ● Expressing agreement and disagreement (school subjects, school uniform, general clothes) ● Knowledge of test, Decalogue, interview, informative article, agenda, poem, catalogue, song ● Discovering Spanish speaking countries - Cultural approach Bolivia, Colombia ● Describing a stimulus picture to express simple/complex ideas and to maintain a conversation
TOK	● Creating a decalogue of a good teacher, student, education, school. What are your criteria for a good teacher, student, education, etc? ● Writing a text about consumption and environmental issues in their own countries. How is the topic of consumption linked to your own country and everyday life? ● Researching and talking about second hand clothes and about "El Desierto de Atacama in Chile: Clothes cemetery" in a round table. Are we using or abusing the planet? How to tell the difference? **Note**: for the language B and language AB Initio courses, teachers will be using first order questions.
Assessments	Homework and quizzes Interactive oral activities Exam 1 Performance Task or Project 1

UNIT 2: Health, Communication, and Environment	
Timeframe	8 weeks
Learning goals:	● Expressing positive and negative aspects of a work ● Talking about past and moments special actions in life (using indefinite preterite) ● Talking about important characters and their lives ● Giving and understanding information about experience of work ● Talking about daily habits to carry a healthy life ● Expressing physical feelings, moods and aliments ● Giving advice and expressing obligation ● Relating to others in a way formal and informal (*Tú / Usted*) ● Knowledge of report, radio program, bio data, biography, overview, curriculum, podcasts, email, legal article

	● Discovering Spanish speaking countries - Cultural approach- Paraguay, Nicaragua ● Describing a picture: to practice describing a picture, connecting it to a theme. To learn how to use a fluent and clear language in speech to express simple and complex ideas and to maintain a conversation.
TOK	● Read an article about the Mediterranean diet. Compare and contrast their country's diet with the Mediterranean diet. What is considered to be healthy according to each culture? ● Creating a chat conversation using some new digital language from the target language culture. How do the emoticons/new chat words change in your country/language? ● Writing a formal letter to the municipality to propose different ways to help the planet from their local community? How does my action impact the planet's equilibrium? **Note**: for the language B and language AB Initio courses, teachers will be using first order questions.
Assessments	Homework and quizzes Interactive oral activities Exam Performance Task or Project 2

UNIT 3: Migration, Arts, and Technology	
Timeframe	10 weeks
Learning goals:	● Comparing press in paper and digital / Analyzing News ● Express formality or informality by letter or e-mail ● Talking about environmental problems and express opinion, agreement or disagreement ● Developing awareness to help environmental education ● Describing pictures including feelings and emotions, trying to understand the artist's point of view ● Knowledge of email, message, formal letter, informative brochure, slogan, debate
TOK	● After watching the documentary "Eso no se pregunta", ask the class about their own migration story. Why am I here in Istanbul? Which are some stereotypes of people from my country? I hate it when they ask me about …? ● Describing different pieces of art from Hispanic authors. What is more important: the aesthetic or the message? ● Writing an article about the pros and cons about technology in adolescents' daily life. How does technology relate to knowledge? **Note**: for the language B and language AB Initio courses, teachers will be using first order questions.
Assessments	Homework and quizzes Interactive oral activities Exam 2 Performance Task

UNIT 4: Exam Preparation	
Timeframe	7 weeks - Student's leave
Learning goals:	● Discover the origins of Spanish ● Contrast the life of before and now ● Remember last times ● Reflects on multiculturalism ● Technology impact /give tips and instructions ● Advantages and disadvantages of living in a foreign country ● Knowledge of chronology, essay, presentation, dating, telephone list, appointment, entry of forum, synopsis of film, fragment of a novel
Assessments	Homework and quizzes Interactive oral activities Exam Performance Task or Project 4

History

Teacher(s): Ms. Clare Natschowny
Contact details: natschownyc@mefis.k12.tr

Course Description:

The DP History course is a world history course based on a comparative and multi-perspective approach to history. It involves the study of a variety of types of history, including political, economic, social and cultural, and provides a balance of structure and flexibility.

The course emphasizes the importance of encouraging students to think historically and to develop historical skills, as well as gaining factual knowledge. It puts a premium on developing the skills of critical thinking and on developing an understanding of multiple interpretations of history. In this way, the course involves a challenging and demanding critical exploration of the past. Students will be explicitly taught all of the necessary skills to succeed in the course, including thinking and research skills such as comprehension, text analysis, transfer and use of primary and secondary sources.

In the modern world, which is saturated with information from the internet and obsessed with commercial aims, the study of history might seem to have become anachronistic and unnecessary. However, considering these challenges, the subject is arguably more important than ever, providing students with all of the critical analysis, reading and comprehension skills needed to navigate an information-rich world. More so though, by understanding our collective world history, the subject can provide much needed balance, perspective, meaning and above all empathy to our students.

Course Aims & Objectives:

- To enable students to develop an understanding of, and continuing interest in, the past.
- Encourage students to engage with multiple perspectives and to appreciate the complex nature of historical concepts, issues, events and developments.
- Promote international-mindedness through the study of history from more than one region of the world.
- Develop an understanding of history as a discipline and to develop historical consciousness, including a sense of chronology and context and an understanding of different historical perspectives.
- Develop key historical skills, including engaging effectively with sources.
- Increase students' understanding of themselves and of contemporary society by encouraging reflection on the past.

Enduring understandings:

- History is an interpretive discipline, shaped by the perspectives, contexts, and biases of those who record and study it.
- Power and ideology influence the development, structure, and decline of societies.
- Historical events and developments are interconnected, often influenced by complex causes and leading to far-reaching consequences.
- Continuity and change are constant themes in history, occurring simultaneously across different regions and periods.
- The construction of national, regional, and cultural identities is shaped through historical narratives and collective memory.

- Conflict and cooperation are recurring dynamics in human societies and can drive significant political, economic, and social change.
- Historians use evidence selectively and interpretively, and the past can be understood in multiple valid ways.
- The legacy of colonialism, imperialism, and resistance continues to shape the modern world.
- Global events often reflect and impact local histories, and vice versa.
- Historical inquiry fosters empathy, critical thinking, and a deeper understanding of present-day issues.

Key Concepts:

- Change
- Continuity
- Causation
- Consequence
- Significance
- Perspectives

Transdisciplinary Links:

- **Theory of Knowledge (TOK)**: With shared concepts and skills like the interpretation of evidence, perspective, bias and reliability, there is scope for TOK-style debates, source analysis activities or reflective writing exercises focused on the past.
- **English:** With shared concepts and skills such as critical analysis of texts, propaganda, rhetoric or the construction of narrative and argumentative accounts, there is scope for the analysis of speeches and sources from the past. Potential for a joint essay on a topic such as: "How does fiction shape our understanding of historical reality?"
- **Global Politics:** With shared concepts and skills such as power, legitimacy, sovereignty, nationalism or human rights, there is scope for collaboration with simulated debates, linking activities particularly in the field of international relations.

UNIT 1 : Introduction to DP History	
Timeframe	Approx 1 week. (1st Sept. - 5th Sept.)
Learning goals:	Students will understand: ● Class and study expectations. ● The structure and assessment criteria for the course.
Assessments:	Formative: Prior knowledge/skills checks

UNIT 2: The Interwar Years / Versailles to Berlin **Case Study: Hitler's Germany**	
Timeframe	Approx. 18 weeks (8th Sept. - 30th Jan.)
Learning goals:	Students will understand: ● Describe and understand the factors which pushed Germany into authoritarianism. ● Describe the features of Nazi ideology and explain how they influenced the aims of Hitler and Nazi policies. ● Understand the methods used to consolidate and maintain authoritarian power in Germany. ● Have a thorough knowledge of events leading from the impact of the first world war through the period in question; 1914-1945. ● Be able to draw causal links between the various events of the 20th century. ● Be able to critically analyse primary, secondary and tertiary source materials from the time period. ● Describe and understand the repercussions of the First World War as well as the efforts by states and the League of Nations to use international diplomacy in the time period. ● Weimar Germany: the initial crises of the years 1918 - 23, the Golden era of Stresemann and then the rise of Hitler after 1929 ● Hitler's Germany: his consolidation of power 1933 - 34, his economic, social and policies, the nature and organisation of the Nazi state and the extent of resistance to the Nazis ● Italy: reasons for the rise of Mussolini, his consolidation of power, social, political and economic policies. The nature of the fascist state ● Spain: political developments from 1918 leading to the outbreak of civil war in 1936. Foreign involvement in the war and the reasons for Franco's victory ● Describe and understand the factors which pushed Germany into authoritarianism. ● Describe the features of Nazi ideology and explain how they influenced the aims of Hitler and Nazi policies. ● Understand the methods used to consolidate and maintain authoritarian power in Germany.
Assessments:	**Formative:** Written assessment in various styles, such as causal or persuasive. Comprehension/Primary, Secondary and Tertiary source analysis. Debate, classroom discussion, presentation and research tasks. **Summative:** Testing point 1: Students will complete two formal assessments; one in the style of a Paper 1 (Source analysis and comprehension) and the second in the style of Paper 2 (Essay writing)

UNIT 3: The move to Global War **Case Studies: World War 2, Spanish Civil War**	
Timeframe	Approx. 18 weeks (2nd Feb. - 19th June)
Learning goals:	Students will understand: ● Understand how the actions of three countries in two different regio contributed to the 'move to global war' in the 1930s; Italy, Japan and Germany. ● Explain the causes of international tensions during the time period and provi factorial explanations and arguments surrounding the topic. ● Understand how states failed to deal with the repercussions of the First Wor War. ● Be able to describe the foreign policies of France, Britain, Germany, Italy a Russia, including their aims and objectives. ● The contributing factors which led to the Second World War from a variety perspectives. ● Understand and evaluate the reasons for the failure of the Fascist nations World War 2. ● Be able to use historiography, primary and secondary sources to effective support academic writing on the subject. ● To understand the causes, practices, innovations and consequences of the Seco World War across a range of global or cross-regional perspectives. ● To understand the causes, practices, innovations and consequences of the Spani Civil War across a range of global or cross-regional perspectives.
Assessments:	**Formative:** Written assessment in various styles, such as causal or persuasive. Comprehension/Primary, Secondary and Tertiary source analysis. Debate, classroom discussion, presentation and research tasks. **Summative:** Testing point 1: Students will complete two formal assessments; one in the style of a Paper 1 (Sour analysis and comprehension) and the second in the style of Paper 2 (Essay writing)

ECONOMICS

Teacher(s):	Kevin Sheehan
Contact details:	sheehank@mefis.k12.tr
Course Description:	

Economics is an exciting, dynamic subject that allows students to develop an understanding of the complexities and interdependence of economic activities in a rapidly changing world. At the heart of economic theory is the problem of scarcity. While the world's population has unlimited needs and wants, there are limited resources to satisfy these needs and wants. As a result of this scarcity, choices have to be made. The economics course, at both SL and HL, uses economic theories to examine the ways in which these choices are made.

The choices made by economic agents (consumers, producers and governments) generate positive and negative outcomes and these outcomes affect the relative well-being of individuals and societies. As a social science, economics examines these choices through the use of models and theories. The Diploma Programme (DP) economics course allows students to explore these models and theories, and apply them, using empirical data, through the examination of the following six real-world issues which are posed as economic questions.

Economic theory suggests that the material well-being of societies is related to the quantity of goods and services that are available to that society. As a result, economic growth and increased efficiency have become prominent goals. However, there are two important global economic issues related to these goals and the choices made by economic agents. These are the ways in which economic activity impacts the environment, and the challenges facing the world in terms of fair access to resources, goods and services. When exploring these significant global issues, sustainability and equity become key concepts for DP economics students to understand. In all areas of economic activity, the economic agents can be divided up into the private sector (consumers and producers) and the public sector (governments). To different extents and with different outcomes, the public sector in any economy assumes some responsibility for monitoring and regulating the behaviour of the private sector. This government intervention is a significant concept that appears throughout the course and students are expected to critically evaluate the balance between the market forces of the private sector and intervention by governments.

By focusing on the six real-world issues through the nine key concepts (scarcity, choice, efficiency, equity, economic well-being, sustainability, change, interdependence and intervention), students of the economics course will develop the knowledge, skills, values and attitudes that will encourage them to act responsibly as global citizens.

Course Aims & Objectives:

- Encourage the systematic and critical study of: human experience and behaviour; physical, economic and social environments; the history and development of social and cultural institutions
- Develop in the student the capacity to identify, analyse critically and evaluate theories, concepts and arguments about the nature and activities of the individual and society
- Enable the student to collect, describe and analyse data used in studies of society, and to test hypotheses and interpret complex data and source material
- Promote the appreciation of the way in which learning is relevant to both the culture in which the student lives and the culture of other societies
- Develop an awareness in the student that human attitudes and opinions are widely diverse and that a study of society requires an appreciation of such diversity
- Enable the student to recognize that the content and methodologies of the individuals and societies group are contestable and that their study requires the tolerance of uncertainty.
- Develop a critical understanding of a range of economic theories, models, ideas and tools in the areas of

microeconomics, macroeconomics and the global economy.

Enduring understandings:

- Students will understand key economic theories, concepts and skills and their real-world application.
- Students will understand and appreciate the impact on individuals and societies of economic interactions between nations.
- Students will understand basic economic numeracy and literacy and how to illustrate and explain simple data including graphs and diagrams.
- Students will understand how to identify and discriminate between differing sources of information and how to distinguish between facts and value judgments in economic issues.
- Students will understand the development issues facing nations as they undergo the process of change.
- Students will understand how to use tools of economic analysis and skills of economic investigation in particular situations.

Key Concepts:

Scarcity	Equity	Change
Choice	Economic well-being	Interdependence
Efficiency	Sustainability	Intervention

Transdisciplinary Links:

- There are connections to math in the form of measuring utility by setting arbitrary numbers and trying to figure out benefits and cost of ideas.
- Mathematics thinking at margins which is the idea of the next number.
- Biology idea of scarcity and human desires.
- English writing argumentative and persuasive essays based around government actions.
- Philosophy and idea of logical thinking and humans being rational thinkers.
- Psychology and the idea of how to adjust human behavior using economic policies.

Theory of Knowledge:

In the realm of economics, the Theory of Knowledge (TOK) can be utilized as an effective strategy to both introduce and conclude a chapter, fostering students' evaluation and critical thinking skills while captivating their interest. By commencing the chapter with a compelling TOK question pertaining to economics, such as "To what extent does self-interest influence economic decision-making?", students are immediately prompted to explore various perspectives, critically assess underlying assumptions, and discern biases within economic theories. This initiates a sense of curiosity and primes them for a deeper investigation. Furthermore, concluding the chapter by revisiting the TOK question and challenging students to reflect on their evolving understanding of the subject matter encourages metacognition and the development of analytical abilities, enabling them to construct more nuanced arguments and make informed judgments about economic phenomena. By adopting this approach, instructors can leverage the power of TOK to captivate students, enhance their engagement, and cultivate their skills in evaluation and critical thinking within the realm of economics.

Unit 4: International Economics

1. How does globalization impact the distribution of wealth and income among nations?
2. What role does cultural relativism play in shaping international trade agreements and policies?

Unit 5: Development Economics

1. To what extent can economic growth alone be considered a comprehensive measure of human development?
2. How does the historical legacy of colonization affect economic development in former colonies?

Unit 6: HL Extension - Economic Development

1. What are the ethical considerations involved in foreign aid and development assistance programs?
2. To what extent do institutions, such as property rights and the rule of law, contribute to or hinder economic development in different countries?

UNIT 3.3 and 3.4: Macroeconomic Objective and Economics of Inequality and Poverty	
Timeframe:	4 weeks
Learning goals:	• Understanding economic growth • Measurement of economic growth • Short term growth • Actual output • Long term growth • Potential output • Interpreting growth using the PPC model • Consequences of economic growth for living standards, the environment and income distribution. • Measuring unemployment and the unemployment rate • Difficulties of measuring unemployment • Causes of unemployment: frictional, structural, demand deficient, seasonal, regional • Natural rate of unemployment • Costs of unemployment • Measuring the inflation rate using a consumer price index (CPI) • Problems of measuring inflation • Causes of inflation: demand-pull and cost-push inflation • Costs of a high inflation rate • Causes of deflation • Costs of deflation • Relationship between equality and equity • The meaning of economic inequality • Unequal distribution of income and wealth • Measuring economic inequality using the Lorenz curve and Gini coefficient • Construction of a Lorenz curve from income quintile data (HL) • Meaning of poverty • Difference between absolute and relative poverty • Measuring poverty: international poverty lines, minimum income standards, Multidimensional Poverty Index (MPI) • Difficulties in measuring poverty • Causes of economic inequality and poverty • Impact of inequality on: economic growth, standards of living and social stabilityThe role of taxation to improve equality, equity and poverty • Progressive, regressive and proportional taxes • Average and marginal tax rates • Direct taxes and indirect tax on equality

	● Calculation of total tax and average tax rates from a set of data (HL only) ● Other policies to improve equality, equity and poverty including: investment in human capital, transfer payments, targeted spending on goods and services, universal basic income, anti-discrimination laws and minimum wages
Assessments	Paper 2, Quizzes, Project, UbD Projects, Case Studies

UNIT 4: Global Economy	
Timeframe	15 Weeks
Learning goals:	Students will understand: ● The benefits of trade ● Absolute and comparative advantage ● The World Trade Organization (WTO) ● Types of trade protection ● Arguments for and against trade protection (arguments against and for free trade) ● Determination of freely floating exchange rates ● Causes of changes in the exchange rate ● The effects of exchange rate changes ● Fixed exchange rates,Managed exchange, Evaluation of different exchange rate systems ● Structure of Balance of Payments ● Current Account ● Economics Integration ● Term of Trade (HL) ● Economic growth may not always need to economic development ● Underdeveloped countries are different ● Decisions made by governments, producers and consumers in developed nations impact growth and development of underdeveloped countries ● Governments play a significant role in development ● Aid may result in positive and negative externalities on underdeveloped countries
Assessments	Written exam (Paper 2), Performance task 1, AND Simulations,Small Group Work, Presentations,Written CommentariesGroup Discussions, Debates,Real World Application,Applying Maths,Connection to TOK/ CAS/ EE , **IA # 3**

UNIT 2 HL : 2.4 Behavioral Economics, 2.11 Market Power, 2.12 Markets Inability	
Timeframe	4 Weeks
Learning goals:	Students will understand: ● maximizing profits ● the meaning of economic costs ● when economic profits are zero ● homogeneous and differentiated products ● entry barriers ● perfect competition ● monopoly and oligopoly ● concentration ratios

	● abuse of market power. ● rational consumer choice ● behavioural economics in action.
Assessments	Written exam (Paper 3), Performance Task 2,AND Simulations,Small Group Work, Presentations,Written CommentariesGroup Discussions, Debates,Real World Application,Applying Maths,Connection to TOK/ CAS/ EE

UNIT 4: SL/HL Revision	
Timeframe:	4 weeks
Learning goals:	Students will understand: ● Decisions are best on utility ● Markets are usually a good way to organize economic activity ● People respond to incentives ● Rational humans think at the margin ● People face trade-offs ● Efficient use of resources may not lead to social optimal levels ● Knowledge of market forces may change people's economic decisions ● Governments may improve market outcomes ● Efficient use of resources may not lead to social optimal levels ● Government intervention has consequences on stakeholders ● Society face a short-run tradeoff between inflation and unemployment ● Prices rise when the government prints too much money ● Governments may improve markets ● Governments may improve market outcomes ● Government intervention has consequences on stakeholders ● Trade benefits both parties ● Trade is unequal ● Trade creates more efficient channels to better allocate scarce resources in an increasingly connected world ● Economic growth may not always need economic development. ● Underdeveloped countries are different ● Decisions made by governments, producers and consumers in developed nations impact growth and development of underdeveloped countries ● Governments play a significant role in development ● Aid may result in positive and negative externalities on underdevelopment countries
Assessments	Mock Exams, Performance task 4, quizzes and projects

UNIT 5: Post IB Exams UNIT	
Timeframe:	2 weeks
Students Will	Explore Economics in the Real World via Case Studies, Videos, Movies, and other media.

BIOLOGY

Teacher(s): Corinne Estrada

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Course Description:

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 of time 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 underway, 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.

Biologists attempt to understand the living world at all levels using many different approaches and techniques. At one end of the scale is the cell, its molecular construction and complex metabolic reactions. At the other end of the scale, biologists investigate the interactions that make whole ecosystems function.

The IB2 year continues with the rigorous analysis of research and conceptual framework that began last year. All students will complete their internal assessment requirement (20% of the final mark), and we will concentrate on increasing students' knowledge base and ensuring that they are well prepared for the exams in May.

Course Aims & Objectives:

IB Biology aims to

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

Textbook: Oxford IB Diploma Programme Biology
ISBN: 978-0-19-839211-8

Enduring understandings:

- Students will understand scientific study and creativity within a global context through stimulating and challenging opportunities.
- Students will understand a body of knowledge, methods and techniques that characterize science and technology.
- Students will understand how to analyse, evaluate and synthesize scientific information.
- Students will understand the need for, and the value of, effective collaboration and communication during scientific activities.
- Students will understand experimental and investigative scientific methods whilst using current technologies.
- Students will understand 21st century communication methods in the study of science.
- Students will understand that science and technology have ethical implications.
- Students will understand the possibilities and limitations of science and technology.
- Students will understand the relationships between scientific disciplines and their influence in other areas of knowledge.

Transdisciplinary Links:

- Physics
- Geography
- Environmental systems and societies
- Chemistry
- Psychology
- Global perspectives

Unit 1: Ecology Topic 4 SL (12 hours). Internal Assessment Work (10 hours)	
Time frame	5 weeks
Learning goals	Understandings •Species are groups of organisms that can potentially interbreed to produce fertile offspring. • Members of a species may be reproductively isolated in separate populations. • Species have either an autotrophic or heterotrophic method of nutrition. • Consumers are heterotrophs that feed on living organisms by ingestion. • Detritivores are heterotrophs that obtain organic nutrients from detritus by internal digestion. • Saprotrophs are heterotrophs that obtain organic nutrients from dead organisms by external digestion. • A community is formed by populations of different species living together and interacting. • A community forms an ecosystem by its interactions with the abiotic environment. • Autotrophs obtain inorganic nutrients from the abiotic environment. • The supply of inorganic nutrients is maintained by nutrient cycling. • Ecosystems have the potential to be sustainable over long periods of time. •Classifying species •Using the chi-squared test •recognizing and interpreting statistical significance
Assessments	Performance task Formal Laboratory Experiment and Report Presentation Quiz Internal Assessment

TOK	Discussion - To what extent do the classification systems we use set limits to what we perceive? PowerPoint presentation- What consequences exist for the public perception and misunderstanding of science when we think about the reality of scientific phenomenon (e.g. climate change). Discussion - How can it be made easier to convince the general public about phenomena that they cannot directly see, like gases being added to the air and the behaviour of electromagnetic radiation. Discussion - What constitutes an unacceptable level of risk (e.g. Burning fossil fuels). The importance of the precautionary principle. When should it be used?

UNIT 2: Plant Biology Topic 9 HL (13 hours) (Revise Topic 1 Cell Structure SL)	
Timeframe	5 weeks
Learning goals:	Understandings: ● Transpiration is the inevitable consequence of gas exchange in the leaf. ● Plants transport water from the roots to the leaves to replace losses from transpiration. ● The cohesive property of water and the structure of the xylem vessels allow transport under tension. ● The adhesive property of water and evaporation generate tension forces in leaf cell walls. ● Active uptake of mineral ions in the roots causes absorption of water by osmosis. Skills: ● Application: Adaptations of plants in deserts and in saline soils for water conservation. ● Application: Models of water transport in xylem using simple apparatus including blotting or filter paper, porous pots and capillary tubing. ● Drawing the structure of primary xylem vessels in sections of stems based on microscope images. ● Measurement of transpiration rates using potometers. (Practical 7) ● Design of an experiment to test hypotheses about the effect of temperature or humidity on transpiration rates.
Assessments	Performance task Formal Laboratory Experiment and Report
TOK	Research - What are the limitations of the teleological viewpoint (nature has intention, evolution is directed)

UNIT 3: Genetics and Evolution Topic 10 HL (8 hours) (Revise Topic 3 Genetics SL)	
Time frame	3 weeks
Learning goals:	Understandings: ● Meiosis leads to independent assortment of chromosomes and unique composition of alleles in daughter cells. ● Genes may be linked or unlinked and are inherited accordingly. ● Gene pools change over time. Skills:

	● Drawing diagrams to show chiasmata formed by crossing over. ● Completion and analysis of Punnett squares for dihybrid traits. ● Calculation of the predicted genotypic and phenotypic ratio of offspring of dihybrid crosses involving unlinked autosomal genes. ● Identification of recombinants in crosses involving two linked genes. ● Use of a chi-squared test on data from dihybrid crosses. ● Identifying examples of directional, stabilizing and disruptive selection. ● Comparison of allele frequencies of geographically isolated populations.
Assessments	Performance task Presentation Exam 1
TOK	Historical research - What role does chance play in discovery (e.g. Sutto and Bovari, why does Sutton get credited?) Discussion - What does the phrase "lies, damned lies and Statistics" suggest? (Mark Twain) Scientific fields that rely on technology, like genetics: What are the knowledge implications for this? Could there be problems of knowledge that are unknown now? Discussion - To what extent is it acceptable to adjust empirical evidence (like phenotypes) to conform to theoretical predictions?

UNIT 4: Evolution and Biodiversity Topic 5 SL (12 hours) (Revise Topic 10 HL)	
Time frame	5 weeks
Learning goals:	Understandings: ● There is overwhelming evidence for the evolution of life on Earth. ● The diversity of life has evolved and continues to evolve by natural selection. ● Species are named and classified using an internationally agreed system. ● The ancestry of groups of species can be deduced by comparing their base or amino acid sequences. Skills: ● Classification of one plant and one animal species from domain to species level. ● Recognize features of bryophytes, filicinophyta, coniferophyta and angiospermophyta. ● Recognize features of porifera, cnidaria, platyhelminthes, annelida, mollusca, arthropoda and chordata. ● Recognition of features of birds, mammals, amphibians, reptiles and fish. ● Construction of dichotomous keys for use in identifying specimens. ● Analysis of cladograms to deduce evolutionary relationships.
Assessments	Performance task Presentation Quiz
TOK	Computer model work - To what extent can computer models be used to test theories? (e.g. Blind Watchmaker computer program). Research Project -What factors influence the development of a scientific consensus such as the theory of evolution?

	Language and Science - Why do the international rules of nomenclature state that genus and species names must be in Ancient Greek or Latin?

UNIT 5: Human Physiology Topic 6 SL (20 hours) and Animal Physiology Topic 11 HL (16 hours)	
Timeframe	8 weeks
Learning goals:	Understandings: ● Immunity is based on recognition of self and destruction of foreign material. ● The roles of the musculoskeletal system are movement, support and protection. ● All animals excrete nitrogenous waste products and some animals also balance water and solute concentrations. ● Sexual reproduction involves the development and fusion of haploid gametes. Skills: ● Analysis of epidemiological data related to vaccination programmes. ● Annotation of a diagram of the human elbow. ● Drawing labelled diagrams of the structure of a sarcomere. ● Analysis of electron micrographs to find the state of contraction of muscle fibres. ● Drawing and labelling a diagram of the human kidney. ● Annotation of diagrams of the nephron. ● Annotation of diagrams of seminiferous tubule and ovary to show the stages of gametogenesis. ● Annotation of diagrams of mature sperm and egg to indicate functions.
Assessments	Performance Task Presentation Formal Laboratory Experiment and Report Exam 2 Mock Exam
TOK	Discussion - What are some variables that affect perceptions of what is “normal”? Use lactose intolerance as an example. Research into stem-cell research in therapeutic cloning. To what extent do motives matter when judging morality of an act? Discussion- Is there a distinction to be drawn between donating eggs for therapeutic cloning experiments and donating eggs to a woman who is unable to produce eggs?

UNIT 6: Review and Exam Preparation	
Timeframe	3 week
Learning goals:	● Practice laboratory skills and revise through laboratory experimentation. ● Recognise the methods used by examiners to distract candidates from the logical answer in multiple choice questions. ● Practise with as many data-based questions as possible in order to extract meaning from empirical data and formulate answers that gain marks at IB level. ● Analyse extended response questions in order to produce answers that will concur with the markscheme. ● Structure answers to essay questions in order to place relevant points in a logical order. ● Ensure that all sections of the syllabus are familiar to the candidate.
Assessments	Performance task Formal Laboratory Experiments Mock Exam

	IB Diploma Exams
TOK	Discussion - What factors influence development of a scientific consensus(Linnaeus system for naming plants) Would a voting system work in science?

CHEMISTRY

Teacher(s): Elias Abou Naccoul

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Course Description:

This course will cover a breadth of topics that cover all the fundamental aspects of IB Chemistry, which is an excellent prerequisite for studying at university level. The course will teach abstract chemical concepts, problem solving and experimental work to develop a high level of logical and critical thinking.

Course Aims & Objectives:

Chemistry is an experimental science that combines academic study with the acquisition of practical and investigational skills. It is called the central science, as chemical principles underpin both the physical environment in which we live and all biological systems. Apart from being a subject worthy of study in its own right, chemistry is a prerequisite for many other courses in higher education, such as medicine, biological science and environmental science, and serves as useful preparation for employment. The Diploma Programme chemistry course includes the essential principles of the subject but also, through selection of options, 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 science in higher education and those who do not.

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

- Appreciate scientific study and creativity within a global context through stimulating and challenging opportunities
- Acquire a body of knowledge, methods and techniques that characterize science and technology
- Apply and use a body of knowledge, methods and techniques that characterize science and technology
- Develop an ability to analyse, evaluate and synthesize scientific information
- Develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
- Develop experimental and investigative scientific skills including the use of current technologies
- Develop and apply 21st century communication skills in the study of science
- Become critically aware, as global citizens, of the ethical implications of using science and technology
- Develop an appreciation of the possibilities and limitations of science and technology
- Develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge

S3.2: Functional groups of organic compounds	
Timeframe	5 weeks
Learning goals:	• Identify different formulas and interconvert molecular, skeletal and structural formulas. • Construct 3D models (real or virtual) of organic molecules. • Identify the following functional groups by name and structure: halogeno, hydroxyl, carbonyl, carboxyl, alkoxy, amino, amido, ester, phenyl. • Identify the following homologous series: alkanes, alkenes, alkynes, halogenoalkanes, alcohols, aldehydes, ketones, carboxylic acids, ethers, amines, amides and esters. • Describe and explain the trend in melting and boiling points of members of a homologous series. • Apply IUPAC nomenclature to saturated or mono-unsaturated compounds that have up to six carbon atoms in the parent chain and contain one type of the following functional groups: halogeno, hydroxyl, carbonyl, carboxyl.

	● Recognize isomers, including branched, straight-chain, position and functional group isomers. **Higher Level only:** ● Describe and explain the features that give rise to cis-trans isomerism; recognize it in non-cyclic alkenes and C3 and C4 cycloalkanes. ● Draw stereochemical formulas showing the tetrahedral arrangement around a chiral carbon. ● Describe and explain a chiral carbon atom giving rise to stereoisomers with different optical properties. ● Recognize a pair of enantiomers as non-superimposable mirror images from 3D modelling (real or virtual). ● Deduce information about the structural features of a compound from specific MS fragmentation patterns. ● Interpret the functional group region of an IR spectrum, using a table of characteristic frequencies (wavenumber/cm^{-1}). ● Interpret ^{1}H NMR spectra to deduce the structures of organic molecules from the number of signals, the chemical shifts, and the relative areas under signals (integration traces). ● Interpret ^{1}H NMR spectra from splitting patterns showing singlets, doublets, triplets and quartets to deduce greater structural detail.
ToK	The label "organic chemistry" originates from a misconception that a vital force was needed to explain the chemistry of life. Can you think of examples where vocabulary has developed from similar misunderstandings? Can and should language ever be controlled to eliminate such problems? Kekulé claimed that the inspiration for the cyclic structure of benzene came from a dream. What role do the less analytical ways of knowledge play in the acquisition of scientific knowledge?
Assessments:	Quiz, Test, Laboratory activities, Completeness of homework assignments, Class participation

R1.3-4 Energy from fuels and Entropy	
Timeframe	3 weeks
Learning goals:	● Deduce equations for reactions of combustion, including hydrocarbons and alcohols. ● Deduce equations for the incomplete combustion of hydrocarbons and alcohols. ● Evaluate the amount of carbon dioxide added to the atmosphere when different fuels burn. ● Understand the link between carbon dioxide levels and the greenhouse effect. ● Understand the difference between renewable and non-renewable energy sources. ● Consider the advantages and disadvantages of biofuels. ● Deduce half-equations for the electrode reactions in a fuel cell. **Higher Level only:** ● Predict whether a physical or chemical change will result in an increase or decrease in entropy of a system. ● Calculate standard entropy changes, $\Delta S^{\ominus}$, from standard entropy values, $S^{\ominus}$. ● Apply the equation $\Delta G^{\ominus} = \Delta H^{\ominus} - T\Delta S^{\ominus}$ to calculate unknown values of these terms. ● Interpret the sign of ΔG calculated from thermodynamic data. ● Determine the temperature at which a reaction becomes spontaneous. ● Perform calculations using the equation $\Delta G = \Delta G^{\ominus} + RT\ln Q$ and its application to a system at equilibrium $\Delta G^{\ominus} = -RT\ln K$.

Assessments	Quiz, Exam, Laboratory activities, Performance Task 1, Completeness of homework assignments, Class participation
TOK	● "I have no doubt that we will be successful in harnessing the sun's energy. If sunbeams were weapons of war we would have had solar energy centuries ago." (Lord George Porter). In what ways might social, political, cultural and religious factors affect the types of research that are financed and undertaken, or rejected? ● There are many ethical issues raised by energy generation and its contributions to pollution and climate change. What is the influence of political pressure on different areas of knowledge? ● Entropy is a technical term which has a precise meaning. How important are such technical terms in different areas of knowledge?

R2.3 The extent of chemical change (Reversible reactions and equilibria)	
Timeframe	3 weeks
Learning goals:	● Describe the characteristics of a physical and chemical system at equilibrium. ● Deduce the equilibrium constant expression from an equation for a homogeneous reaction. ● Determine the relationships between K values for reactions that are the reverse of each other at the same temperature. ● Apply Le Châtelier's principle to predict and explain responses to changes of systems at equilibrium. **Higher Level only:** ● Calculate the reaction quotient Q from the concentrations of reactants and products at a particular time, and determine the direction in which the reaction will proceed to reach equilibrium. ● Solve problems involving values of K and initial and equilibrium concentrations of the components of an equilibrium mixture. ● Calculate the value of the Gibbs energy change ΔG from the equilibrium constant for a reaction.
Assessments:	Exam, Quiz, Laboratory activities, Completeness of homework assignments, Class participation
TOK	● Scientists investigate the world at different scales; the macroscopic and microscopic. Which ways of knowing allow us to move from the macroscopic to the microscopic? ● Chemistry uses a specialized vocabulary: a closed system is one in which no matter is exchanged with the surroundings. Does our vocabulary simply communicate our knowledge; or does it shape what we can know? ● The career of Fritz Haber coincided with the political upheavals of two world wars. He supervised the release of chlorine on the battlefield in World War I and worked on the production of explosives. How does the social context of scientific work affect the methods and findings of science? Should scientists be held morally responsible for the applications of their discoveries?

R3.1 Proton transfer reactions	
Timeframe	5 weeks
Learning goals:	● Deduce the Brønsted–Lowry acid and base in a reaction. ● Deduce the formula of the conjugate acid or base of any Brønsted–Lowry base or acid.

	● Interpret and formulate equations to show acid–base reactions of these species. ● Perform calculations involving the logarithmic relationship between pH and $[H^+]$. ● Recognize solutions as acidic, neutral and basic from the relative values of $[H^+]$ and $[OH^-]$. ● Recognize that acid–base equilibria lie in the direction of the weaker conjugate. ● Formulate equations for the reactions between acids and metal oxides, metal hydroxides, hydrogen carbonates and carbonates. ● Sketch and interpret the general shape of the pH curve. **Higher Level only:** ● Interconvert $[H^+]$, $[OH^-]$, pH and pOH values. ● Interpret the relative strengths of acids and bases from K_a, K_b, pK_a or pK_b values. ● Solve problems involving K_a, K_b and K_w. ● Construct equations for the hydrolysis of ions in a salt, and predict the effect of each ion on the pH of the salt solution. ● Interpret the general shapes of pH curves for all four combinations of strong and weak acids and bases. ● Construct equilibria expressions to show why the colour of an indicator changes with pH. ● Identify an appropriate indicator for a titration from the identity of the salt and the pH range of the indicator. ● Describe the composition of acidic and basic buffers and explain their actions. ● Solve problems involving the composition and pH of a buffer solution, using the equilibrium constant.
Assessments:	Quiz, Exam 1, Laboratory activities, Completeness of homework assignments, Class participation
TOK	● Acid and base behaviour can be explained using different theories. How are the explanations in chemistry different from explanations in other subjects such as history? ● The strength of an acid can be determined by the use of pH and conductivity probes. In what ways do technologies, which extend our senses, change or reinforce our view of the world? ● Is a pH curve an accurate description of reality or an artificial representation? Does science offer a representation of reality?

R3.2 Electron transfer reactions	
Timeframe	4 weeks
Learning goals:	● Deduce oxidation states of an atom in a compound or an ion. ● Identify the oxidized and reduced species and the oxidizing and reducing agents in a chemical reaction. ● Deduce redox half-equations and equations in acidic or neutral solutions. ● Predict the relative ease of oxidation of metals. ● Predict the relative ease of reduction of halogens. ● Interpret data regarding metal and metal ion reactions. ● Deduce equations for reactions of reactive metals with dilute HCl and H_2SO_4. ● Identify electrodes as anode and cathode, and identify their signs/polarities in voltaic cells and electrolytic cells, based on the type of reaction occurring at the electrode. ● Explain the direction of electron flow from anode to cathode in the external circuit, and ion movement across the salt bridge. ● Deduce the reactions of the charging process from given electrode reactions for discharge, and vice versa. ● Explain how current is conducted in an electrolytic cell.

	• Deduce the products of the electrolysis of a molten salt. • Deduce equations to show changes in the functional groups during oxidation of primary and secondary alcohols, including the two-step reaction in the oxidation of primary alcohols. • Deduce equations to show reduction of carboxylic acids to primary alcohols via the aldehyde, and reduction of ketones to secondary alcohols. • Deduce the products of the reactions of hydrogen with alkenes and alkynes. **Higher Level only:** • Interpret standard electrode potential data in terms of ease of oxidation/reduction. • Predict whether a reaction is spontaneous in the forward or reverse direction from $E^{\ominus}$ data. • Determine the value for $\Delta G^{\ominus}$ from $E^{\ominus}$ data. • Deduce from standard electrode potentials the products of the electrolysis of aqueous solutions. • Deduce equations for the electrode reactions during electroplating.
Assessments:	Exam, Quiz, Laboratory activities, Completeness of homework assignments, Class participation
TOK	• Chemistry has developed a systematic language that has resulted in older names becoming obsolete. What has been lost and gained in this process? • Oxidation states are useful when explaining redox reactions. Are artificial conversions a useful or valid way of clarifying knowledge? • Is energy just an abstract concept used to justify why certain types of changes are always associated with each other? Are concepts such as energy real? • The SHE is an example of an arbitrary reference. Would our scientific knowledge be the same if we chose different references?

R3.3 Electron sharing reactions (free radicals)	
Timeframe	1 week
Learning goals	• Identify and represent radicals, e.g. $CH_3^{\bullet}$ and $Cl^{\bullet}$. • Explain, including with equations, the homolytic fission of halogens, known as the initiation step in a chain reaction. • Explain, using equations, the propagation and termination steps in the reactions between alkanes and halogens.
Assessments:	Exam, Quiz, Laboratory activities, Completeness of homework assignments, Class participation
TOK	• Reaction mechanisms can be supported by indirect evidence. What is the role of empirical evidence in scientific theories? Can we ever be certain in science?

R3.4 Electron pair sharing reactions	
Timeframe	3 weeks
Learning goals:	• Recognize nucleophiles in chemical reactions. • Deduce equations with descriptions and explanations of the movement of electron pairs in nucleophilic substitution reactions. • Explain, with equations, the formation of ions by heterolytic fission. • Recognize electrophiles in chemical reactions.

	● Deduce equations for the reactions of alkenes with water, halogens, and hydrogen halides. **Higher Level only:** ● Apply Lewis acid–base theory to inorganic and organic chemistry to identify the role of the reacting species. ● Draw and interpret Lewis formulas of reactants and products to show coordination bond formation in Lewis acid–base reactions. ● Deduce the charge on a complex ion, given the formula of the ion and ligands present. ● Describe and explain the mechanisms of the reactions of primary and tertiary halogenoalkanes with nucleophiles. ● Predict and explain the relative rates of the substitution reactions for different halogenoalkanes. ● Describe and explain the mechanisms of the reactions between symmetrical alkenes and halogens, water and hydrogen halides. ● Predict and explain the major product of a reaction between an unsymmetrical alkene and a hydrogen halide or water. ● Describe and explain the mechanism of the reaction between benzene and a charged electrophile, E^+.
Assessments:	Quiz, Exam, Performance task, Laboratory Activities, Completeness of Homework Assignments, Class Participation
TOK	● The same phenomenon can sometimes be explored from different perspectives, and explained by different theories. For example, do we judge competing theories by their universality, simplicity or elegance?

PHYSICS

Teacher(s): Brian Burleigh

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Course Description:

The remaining topics of the two-year IB Physics course via experimentation, class discussions and research will be taught. The course is available at both Standard Level (SL) and Higher Level (HL). The topics covered in both are essential for students who aim to study engineering or other science-related courses in their further education. The topics are also useful for students not planning to study science-related subjects, as matter and energy shape and determine the natural world.

Course Aims & Objectives:

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

- Appreciate scientific study and creativity within a global context through stimulating and challenging opportunities
- Acquire a body of knowledge, methods and techniques that characterize science and technology
- Apply and use a body of knowledge, methods and techniques that characterize science and technology
- Develop an ability to analyse, evaluate and synthesize scientific information
- Develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
- Develop experimental and investigative scientific skills including the use of current technologies
- Develop and apply 21st century communication skills in the study of science
- Become critically aware, as global citizens, of the ethical implications of using science and technology
- Develop an appreciation of the possibilities and limitations of science and technology
- Develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.

Enduring understandings:

- Students will understand scientific study and creativity within a global context through stimulating and challenging opportunities.
- Students will understand a body of knowledge, methods and techniques that characterize science and technology.
- Students will understand how to analyse, evaluate and synthesize scientific information.
- Students will understand the need for, and the value of, effective collaboration and communication during scientific activities.
- Students will understand experimental and investigative scientific methods whilst using current technologies.
- Students will understand 21st century communication methods in the study of science.
- Students will understand that science and technology have ethical implications.
- Students will understand the possibilities and limitations of science and technology.
- Students will understand the relationships between scientific disciplines and their influence in other areas of knowledge.

UNIT 1: D.2 Electric and magnetic fields	
Timeframe	14 hours
Learning goals:	**Standard level and higher level: 8 hours** Students should understand: ● the direction of forces between the two types of electric charge ● Coulomb's law for charged bodies treated as point charges ● the conservation of electric charge ● Millikan's experiment as evidence for quantization of electric charge ● that the electric charge can be transferred between bodies using friction, electrostatic induction and by contact, including the role of grounding (earthing) ● the electric field strength as given by $E = Fq$ ● electric field lines ● the relationship between field line density and field strength ● the uniform electric field strength between parallel plates as given by $E = Vd$ ● magnetic field lines. **Additional higher level: 6 hours** Students should understand: ● the electric potential energy Ep in terms of work done to assemble the system from infinite separation ● the electric potential energy for a system of two charged bodies ● that the electric potential is a scalar quantity with zero defined at infinity ● that the electric potential Ve at a point is the work done per unit charge to bring a test charge from infinity to that point • the electric field strength E as the electric potential gradient • the work done in moving a charge q in an electric field as given by $W = q\Delta V$e ● equipotential surfaces for electric fields ● the relationship between equipotential surfaces and electric field lines
Assessments	Quiz, Exam, Laboratory activities, Completeness of homework assignments, Class participation
TOK	● Which experiments provided evidence to determine the nature of the electron? ● How can the properties of fields be understood using both an algebraic approach and a visual representation?

UNIT 2: D.3 Motion in electromagnetic fields Guiding questions	
Timeframe	6 Hours
Learning goals:	● **Standard level and higher level: 6 hours** Students should understand: ● the motion of a charged particle in a uniform electric field ● the motion of a charged particle in a uniform magnetic field

	• the motion of a charged particle in perpendicularly orientated uniform electric and magnetic fields • the magnitude and direction of the force on a charge moving in a magnetic field as given by $F = qvB \sin\theta$ • the magnitude and direction of the force on a current-carrying conductor in a magnetic field as given by $F = BIL \sin\theta$ • the force per unit length between parallel wires **Additional higher level** There is no additional higher level content in D.3.
Assessments	Quiz, Exam, Laboratory activities, Completeness of homework assignments, Class participation
TOK	• How do charged particles move in magnetic fields? What can be deduced about the nature of a charged particle from observations of it moving in electric and magnetic fields? •

UNIT 3: B.5 Current and circuits Guiding questions	
Timeframe	6 hours
Learning goals:	**Standard level and higher level: 6 hours** Students should understand: • that cells provide a source of emf • chemical cells and solar cells as the energy source in circuits • that circuit diagrams represent the arrangement of components in a circuit • direct current (dc) I as a flow of charge carriers as given by $I = \Delta q\ \Delta t$ • that the electric potential difference V is the work done per unit charge on moving a positive charge between two points along the path of the current as given by $V = Wq$ • the properties of electrical conductors and insulators in terms of mobility of charge carriers • electric resistance and its origin • electrical resistance R as given by $R = VI$ • resistivity as given by $\rho = RA$ • Ohm's law • the ohmic and non-ohmic behaviour of electrical conductors, including the heating effect of resistors • the combinations of resistors in series and parallel circuits • that electric cells are characterized by their emf ε and internal resistance r as given by $\varepsilon = I(R + r)$

	● that resistors can have variable resistance. **Additional higher level** There is no additional higher level content in B.5.
Assessments	Quiz, Exam, Laboratory activities, Completeness of homework assignments, Class participation
TOK	● The role of luck/serendipity in successful scientific discovery is almost inevitably accompanied by a scientifically curious mind that will pursue the outcome of the "lucky" event. To what extent might scientific discoveries that have been described as being the result of luck actually be better described as being the result of reason or intuition?

UNIT 4: D.4 Induction	
Timeframe	6 hours
Learning goals:	**Standard level and higher level** There is no standard level content in D.4. **Additional higher level: 6 hours** Students should understand: ● magnetic flux $\mathbf{\Phi}$ as given by $\mathbf{\Phi} = BA\cos\theta$ ● that a time-changing magnetic flux induces an emf ε as given by Faraday's law of induction ● that a uniform magnetic field induces an emf in a straight conductor moving perpendicularly to it as given by $\varepsilon = BvL$ ● that the direction of induced emf is determined by Lenz's law and is a consequence of energy conservation ● that a uniform magnetic field induces a sinusoidal varying emf in a coil rotating within it ● the effect on induced emf caused by changing the frequency of rotation.
Assessments	Quiz, Laboratory activities, Completeness of homework assignments, Class participation
TOK	● What are the effects of relative motion between a conductor and a magnetic field? How can the power output of electrical generators be increased? ● How did the discovery of electromagnetic induction effect industrialization?

UNIT 5: E.1 Structure of the atom	
Timeframe	9 hours
Learning goals:	**Standard level and higher level: 6 hours** Students should understand: ● the Geiger–Marsden–Rutherford experiment and the discovery of the nucleus ● that emission and absorption spectra provide evidence for discrete atomic energy levels ● that photons are emitted and absorbed during atomic transitions

	● that the frequency of the photon released during an atomic transition depends on the difference in energy level as given by $E = hf$ ● that emission and absorption spectra provide information on the chemical composition. **Additional higher level: 3 hours** Students should understand: the relationship between the radius and the nucleon number for a nucleus as given by $R = R0A13$ and implications for nuclear densities ● deviations from Rutherford scattering at high energies ● the distance of closest approach in head-on scattering experiments ● the discrete energy levels in the Bohr model for hydrogen as given by $E = -13.6\ \text{eV}\ n2$ ● that the existence of quantized energy and orbits arise from the quantization of angular momentum in the Bohr model for hydrogen as given by $mvr = nh$.
Assessments	Quiz, Exam, Laboratory activities, Completeness of homework assignments, Class participation
TOK	What is the current understanding of the nature of an atom? What is the role of evidence in the development of models of the atom? In what ways are previous models of the atom still valid despite recent advances in understanding?

Unit 6 : B.2 Greenhouse effect	
Timeframe	6 hours
Learning goals:	**Standard level and higher level: 6 hours** Students should understand: ● the conservation of energy ● emissivity as the ratio of the power radiated per unit area by a surface compared to that of an ideal black surface at the same temperature as given by emissivity = power radiated per unit area $\sigma T4$ ● albedo as a measure of the average energy reflected off a macroscopic system as given by albedo = total scattered power total incident power ● that Earth's albedo varies daily and is dependent on cloud formations and latitude ● the solar constant S ● that the incoming radiative power is dependent on the projected surface of a planet along the direction of the path of the rays, resulting in a mean value of the incoming intensity being $S4$ ● that methane CH4, water vapour H2O, carbon dioxide CO2, and nitrous oxide N2O, are the main greenhouse gases and each of these has origins that are both natural and created by human activity

	● the absorption of infrared radiation by the main greenhouse gases in terms of the molecular energy levels and the subsequent emission of radiation in all directions ● that the greenhouse effect can be explained in terms of both a resonance model and molecular energy levels ● that the augmentation of the greenhouse effect due to human activities is known as the enhanced greenhouse effect. **Additional higher level** There is no additional higher level content in B.2.
Assessments	Quiz, Exam, Completeness of homework assignments, Class participation
TOK	How does the greenhouse effect help to maintain life on Earth and how does human activity enhance this effect? How is the atmosphere as a system modelled to quantify the Earth–atmosphere energy balance?

Unit 7 : E.2 Quantum Physics	
Timeframe	8 Hours
Learning goals:	**Standard level and higher level** There is no standard level content in E.2. **Additional higher level: 8 hours** Students should understand: ● the photoelectric effect as evidence of the particle nature of light ● that photons of a certain frequency, known as the threshold frequency, are required to release photoelectrons from the metal ● Einstein's explanation using the work function and the maximum kinetic energy of the photoelectrons as given by $E\text{max} = hf - \Phi$ where Φ is the work function of the metal ● diffraction of particles as evidence of the wave nature of matter ● that matter exhibits wave–particle duality ● the de Broglie wavelength for particles ● Compton scattering of light by electrons as additional evidence of the particle nature of light ● that photons scatter off electrons with increased wavelength ● the shift in photon wavelength after scattering off an electron
Assessments	Quiz, Exam, Completeness of homework assignments, Class participation
TOK	How can light be used to create an electric current? What is meant by wave–particle duality?

Unit 8 : E.3 Radioactive decay	
Timeframe	12 hours
Learning goals:	**Standard level and higher level: 7 hours** Students should understand: ● isotopes ● nuclear binding energy and mass defect ● the variation of the binding energy per nucleon with nucleon number • ● the existence of the strong nuclear force, a short-range, attractive force between nucleons ● the random and spontaneous nature of radioactive decay ● the changes in the state of the nucleus following alpha, beta and gamma radioactive decay • the mass-energy equivalence as given by $E = mc2$ in nuclear reactions the radioactive decay equations involving $\alpha, \beta-, \beta+, \gamma$ ● the existence of neutrinos v and antineutrinos v ● the penetration and ionizing ability of alpha particles, beta particles and gamma rays ● the activity, count rate and half-life in radioactive decay ● the changes in activity and count rate during radioactive decay using integer values of half-life ● the effect of background radiation on count rate. **Additional higher level: 5 hours** Students should understand: ● the evidence for the strong nuclear force ● the role of the ratio of neutrons to protons for the stability of nuclides ● the approximate constancy of binding energy curve above a nucleon number of 60 ● that the spectrum of alpha and gamma radiations provides evidence for discrete nuclear energy levels ● the continuous spectrum of beta decay as evidence for the neutrino • the decay constant λ and the radioactive decay law • that the decay constant approximates the probability of decay in unit time only in the limit of sufficiently small λt the activity as the rate of decay • the relationship between half-life and the decay constant .
Assessments	Quiz, Exam, Completeness of homework assignments, Class participation
TOK	Why are some isotopes more stable than others? In what ways can a nucleus undergo change? How do large, unstable nuclei become more stable?

Unit 9 : E.4 Fission	
Timeframe	4 hours
Learning goals:	**Standard level and higher level: 4 hours** Students should understand: ● that energy is released in spontaneous and neutron-induced fission ● the role of chain reactions in nuclear fission reactions ● the role of control rods, moderators, heat exchangers and shielding in a nuclear power plant ● the properties of the products of nuclear fission and their management. **Additional higher level** There is no additional higher level content in E.4
Assessments	Quiz, Exam, Completeness of homework assignments, Class participation
TOK	In which form is energy stored within the nucleus of the atom? How can the energy released from the nucleus be harnessed?

Unit 10 : E.5 Fusion and stars	
Timeframe	6 hours
Learning goals:	● **Standard level and higher level: 6 hours** Students should understand: ● that the stability of stars relies on an equilibrium between outward radiation pressure and inward gravitational forces ● that fusion is a source of energy in stars ● the conditions leading to fusion in stars in terms of density and temperature ● the effect of stellar mass on the evolution of a star
Assessments	Quiz, Exam, Completeness of homework assignments, Class participation
TOK	How are elements created? What physical processes lead to the evolution of stars? Can observations of the present state of the universe predict the future outcome of the universe?

Unit 11 : A.5 Fusion and stars	
Timeframe	8 hours
Learning goals:	**Students should understand:** ● Reference frames. ● That Newton's laws of motion are the same in all inertial reference frames, known as Galilean relativity.

	● That in Galilean relativity, the position x′x′ and time t′t′ of an event are given by:That Galilean transformation equations lead to the velocity addition equation as given by: ● The two postulates of special relativity. ● That the postulates of special relativity lead to the Lorentz transformation equations for the coordinates of an event in two inertial reference frames as given by: ● That Lorentz transformation equations lead to the relativistic velocity addition equation as given by ● that the space–time interval Δs between two events is an invariant quantity ● proper time interval and proper length ● time dilation ● length contraction ● the relativity of simultaneity ● space–time diagrams ● that the angle between the world line of a moving particle and the time axis on a space–time diagram is related to the particle's speed as given by $\tan \theta = vc$ ● *T*hat muon decay experiments provide experimental evidence for time dilation and length contraction.
Assessments	Quiz, Exam, Completeness of homework assignments, Class participation
TOK	How do observers in different reference frames describe events in terms of space and time? How does special relativity change our understanding of motion compared to Galilean relativity? How are space–time diagrams used to represent relativistic motion?

MATHEMATICS APPLICATIONS & INTERPRETATION (SL)

Teacher(s): Wissam Malaeb

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Course Description:

Applications and Interpretation (AI) course is a two-year program designed for students who enjoy applying mathematics to real-world contexts. It emphasizes modeling, data analysis, and the use of technology to solve practical problems, while developing critical thinking and statistical reasoning. The course prepares students for further studies in fields such as social sciences, business, life sciences, and other disciplines where applied mathematics plays a key role.

Course Aims & Objectives:

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

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

Enduring understandings:

- Different statistical calculations can be used to make sense of data to answer real life questions.
- Real world situations can be represented symbolically and graphically.
- Graphs can be used when interpreting data.
- Mathematical models can be represented by using the functions and this helps to understand quantitative relationships.
- Using mathematical logic can clarify arguments and be used in different industries

- Using probability helps us to make inferences and predictions.
- Randomisation has an effect on the conclusions formed from surveys, experiments, and observational studies.
- Functions can be analyzed graphically by rates of change and optimization.
- Derivatives are the underlying concept supporting physical applications that are embedded in many fields.
- The physics concepts of position, velocity and acceleration are related mathematically by the derivative.
- How can we determine the rate of change mathematically and interpret its contextual meaning to make decisions in real life situations?

UNIT 1: PROBABILITY	
Timeframe	6 weeks
Learning goals:	● The normal distribution. ● The concept of a random variable; of the parameters μ and σ ; of the bell shape; the symmetry about $x = \mu$. ● Diagrammatic representation. ● Normal probability calculations. ● Inverse normal calculations. ● Basic concepts of set theory: elements $x \in A$; subsets $A \subset B$; intersection $A \cap B$; and union ● $A \cup B$; complement A'. ● Venn diagrams and simple applications. ● Sample space; event A; complementary event, A' . ● Probability of an event. ● Probability of a complementary event. ● Expected value. ● Probability of combined events, mutually exclusive events, independent events. ● Probability using “with replacement” and “without replacement”. ● Conditional probability. ● Binomial distribution.
Assessments:	Daily homework, quizzes, worksheets, IB past paper questions, Exam 1
TOK	- What criteria can we use to decide between different models? - To what extent can we trust mathematical models such as the normal distribution? How can we know what to include, and what to exclude, in a model? - Does correlation imply causation? Mathematics and the world. Given that a set of data may be approximately fitted by a range of curves, where would a mathematician seek for knowledge of which equation is the “true” model? - Why have some research journals “banned” p -values from their articles because they deem them too misleading? In practical terms, is saying that a result is significant the same as saying it is true? How is the term “significant” used differently in different areas of knowledge?

UNIT 2: CALCULUS	
Timeframe	16 weeks

Learning goals:	● Concept of the derivative as a rate of change. ● Concept of limits. ● Tangent to a curve. ● The principle that $f(x) = ax^n \Rightarrow f'(x) = anx^{n-1}$. ● The derivative of functions of the form $f(x) = ax^n + bx^{n-1} + \ldots$, where all exponents are integers. ● Gradients of curves for given values of x. Values of x where $f'(x)$ is given. ● Equation of the tangent at a given point. ● Equation of the line perpendicular to the tangent at a given point (normal). ● Increasing and decreasing functions. Graphical interpretation of $f'(x) > 0$, $f'(x) = 0$ and $f'(x) < 0$. ● Values of x where the gradient of a curve is zero. ● Solution of $f'(x) = 0$. ● Stationary points. ● Introduction to integration and anti- differentiation ● Definite integrals using technology. ● Optimisation problems ● Approximating areas using the trapezoidal rule. -

Assessments:	Daily homework, quizzes, worksheets, IB past paper questions, Exam 2
TOK	-What value does knowledge of limits have? Is infinitesimal behaviour applicable to real life? Is intuition a valid way of knowing in mathematics? -The seemingly abstract concept of calculus allows us to create mathematical models that permit human feats such as getting a man on the Moon. What does this tell us about the links between mathematical models and reality? -In what ways has technology impacted how knowledge is produced and shared in mathematics? Does technology simply allow us to arrange existing knowledge in new and different ways, or should this arrangement itself be considered knowledge? -Is it possible for an area of knowledge to describe the world without transforming it? -How can the rise in tax for plastic containers, for example plastic bags, plastic bottles etc be justified using optimization?

UNIT 3: MATHEMATICAL EXPLORATION	
Timeframe	2 weeks
Learning goals:	● Develop students' personal insight into the nature of mathematics and to develop their ability to ask their own questions about mathematics. ● Encourage students to initiate and sustain a piece of work in mathematics. ● Enable students to acquire confidence in developing strategies for dealing with new situations and problems. ● Provide opportunities for students to develop individual skills and techniques, and to allow students. ● With varying abilities, interests and experiences to achieve a sense of personal satisfaction in studying mathematics. ● Enable students to experience mathematics as an integrated organic discipline rather than fragmented and compartmentalized skills and knowledge. ● Enable students to see connections and applications of mathematics to other areas of interest. ● Provide opportunities for students to show, with confidence, what they know and what they can do.
Assessments:	Project (mathematical exploration)

REVIEW AND PREPARATION FOR IB EXAM	
Timeframe	5 weeks
Learning goals:	Review examination techniques and knowledge required to improve the quality of student answers on the official IBDP examinations.
Assessments	Daily homework, quizzes, IB past paper questions.

MATHEMATICS ANALYSIS AND APPROACHES (SL)

Teacher(s): Cansu Çoban

Contact details: cobanc@mefis.k12.tr

Course Description:

This course caters to students who already possess knowledge of basic mathematical concepts and who are equipped with the skills needed to apply simple mathematical techniques correctly. The majority of these students are expected to have a sound mathematical background as they prepare for future studies in a wide-range of subjects.

The course focuses on introducing important mathematical concepts through the development of mathematical techniques. The intention is to introduce students to these concepts in a comprehensible and coherent way, rather than insisting on the mathematical rigour required at Higher Level Mathematics. Students should, wherever possible, apply the mathematical knowledge they have acquired to solve realistic problems set in an appropriate context. The internally assessed component of the course known as the mathematical exploration offers students the opportunity for developing independence in their mathematical learning. Students are encouraged to take a considered approach to various mathematical activities and to explore different mathematical ideas. The exploration also allows students to work without the time constraints of a written examination and to develop the skills they need for communicating mathematical ideas.

Course Aims & Objectives:

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

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

Enduring understandings:

- Visualisation, spatial reasoning, and geometric modelling are strategies to enhance problem solving.
- There are several function specific methods of solution but there are several methods that can be universally applied to solve problems.
- Vectors present an approach to model, manipulate and interpret objects and forces in action in a way that is both practical and meaningful.

Transdisciplinary Links:

- English – MLA format to be reviewed and used in the preparation of the exploration.
- TOK : Suppose that Newton and Leibnitz did develop calculus independently of one another. Would this offer support to the idea that calculus was discovered or that it was invented?
- Physics : Students will look at the relationship between force, mass and acceleration. They will calculate displacement, velocity and acceleration.
- TOK : A result that defies logic is called a paradox. Gabriel's horn is one example of a paradox. Research some other examples in mathematics of paradoxes and explain why it is a paradox.
- Physics: While distance and speed are scalar quantities, displacement, velocity and acceleration are vector quantities.

UNIT 1: GEOMETRY AND TRIGONOMETRY	
Timeframe	10 weeks
Learning goals:	3.1 The distance between two points in three dimensional space, and their midpoint. Volume and surface area of three-dimensional solids including right-pyramid, right cone, sphere, hemisphere and combinations of these solids. The size of an angle between two intersecting lines or between a line and a plane. 3.2 Use of sine, cosine and tangent ratios to find the sides and angles of right-angled triangles. The sine rule: . The cosine rule:. Area of a triangle 3.3 Applications of right and non-right angle trigonometry, including Pythagoras's theorem. Angles of elevation and depression. Construction of labelled diagrams from written statements. 3.4 The circle: radian measure of angles; length of an arc; area of a sector. 3.5 Definition of cos, sin in terms of the unit circle. Definition of tan as sin/cos. Exact values of trigonometric ratios of 0, , , and their multiples. Extension of the sine rule to the ambiguous case. 3.6 The Pythagorean identity . Double angle identities for sine and cosine. The relationship between trigonometric ratios. 3.7 The circular functions ,sınx , cosx and tanx ;amplitude, their periodic nature, and their graphs Composite functions of the form a sin(b(x + c)) + d Transformations. Real-life contexts. 3.8

	Solving trigonometric equations in a finite interval, both graphically and analytically. Equations leading to quadratic equations in sinx, cosx or tanx
Assessments	Daily homework, Quizzes, Exams, Class participation and behaviour, Performance task.
TOK:	When was the word ''sine'' first used and why?

UNIT 2: CALCULUS	
Timeframe	13 weeks
Learning goals:	5.1 Introduction to the concept of a limit. Derivative interpreted as gradient function and as rate of change. 5.2 Increasing and decreasing functions. Graphical representation of , 0. 5.3 Derivative of $f(x) = ax^n$ anx^{n-1}, n. The derivative of functions of the form $f(x) = ax^n + bx^{n-1}$ where all exponents are integers. 5.4 Tangents and normal at a given point, and their equations. 5.5 Introduction to integration as anti-differentiation of functions of the form $f(x) = ax^n + bx^{n-1} + ...$ where n and n - 1. Anti-differentiation with a boundary condition to determine the constant term. Definite integrals using technology. Area of a region enclosed by a curve y = f(x) and the x-axis, where f(x) 0. 5.6 Derivative of x^n , sinx, cosx, e^x and lnx. Differentiation of a sum and multiple of these functions. The chain rule for composite functions. The product and quotient rules. 5.7 The second derivative. Graphical behaviour of functions, including the relationship between the graphs of f, f' and f''. 5.8 Local maximum and minimum points. Testing for maximum and minimum. Optimization. Points of inflection with zero and non-zero gradients. 5.9 Kinematic problems involving displacement s, velocity v, acceleration a and total distance travelled. 5.10 Indefinite integral of x^n (n), sinx, cosx, and e^x.

	The composites of any of these with the linear function ax + b. Integration by inspection (reverse chain rule) or by substitution for expressions of the form: 5.11 Definite integrals, including analytical approach.
Assessments	Daily homework, Quizzes, Exams, Class participation and behaviour, Performance tasks.
TOK:	What value does the knowledge of limits have? Mathematics - invented or discovered? What is the difference between inductive and deductive reasoning? How can casual relationships be established in mathematics? Where does mathematics come from? How does belief differ from knowledge?

UNIT 3: Mathematical Exploration (Finalise, grade and submit the exploration)	
Timeframe	3 weeks
Learning goals:	● Develop students' personal insight into the nature of mathematics and to develop their ability to ask their own questions about mathematics. ● Encourage students to initiate and sustain a piece of work in mathematics. ● Enable students to acquire confidence in developing strategies for dealing with new situations and problems. ● Provide opportunities for students to develop individual skills and techniques, and to allow students with varying abilities, interests and experiences to achieve a sense of personal satisfaction in studying mathematics. ● Enable students to experience mathematics as an integrated organic discipline rather than fragmented and compartmentalised skills and knowledge. ● Enable students to see connections and applications of mathematics to other areas of interest. ● Provide opportunities for students to show, with confidence, what they know and what they can do.
Assessments	Mathematical Exploration

UNIT 4: General revision and preparation for IB Exams	
Timeframe	3 weeks
Learning goals:	● Review of all topics ● Revision of the past paper questions ● Solutions of past paper questions - students bring their difficulties to class.
Assessments	IB past paper questions (Exam - mock exams)

MATHEMATICS ANALYSIS AND APPROACHES (HL)

Teacher(s): Cansu Çoban

Contact details: cobanc@mefis.k12.tr

Course Description:

This course is for students who already possess knowledge of basic mathematical concepts and who are equipped with the skills needed to apply mathematical techniques correctly.
Our main goal is to improve mathematical thinking skills for future studies.

Course Aims & Objectives:

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

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

Enduring understandings:

- Students will understand that mathematics is enjoyable and will develop an appreciation for its elegance and power.
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- Students will understand the principles and nature of mathematics.
- Students will understand the importance of communicating clearly and confidently in a variety of contexts and using appropriate mathematical language and notation.
- Students will understand that logical, critical and creative thinking, and patience and persistence in problem solving are necessary.
- Students will understand how to employ and refine their powers of abstraction and generalization.
- Students will understand how to apply and transfer skills to alternative situations, to other areas of knowledge and to continuous new developments.
- Students will understand how developments in technology and mathematics have influenced each other.
- Students will understand the moral, social and ethical implications arising from the work of mathematicians and the applications of mathematics.

- Students will understand and appreciate the international dimension in mathematics through an awareness of the universality of mathematics and its multicultural and historical perspectives.
- Students will understand the contribution of mathematics to other disciplines.

UNIT 1: Vectors	
Timeframe	2 weeks
Learning goals:	● To provide an elementary introduction to vectors both algebraically and geometrically. ● To provide the sum and difference of two vectors, the zero vector, the vector –v, multiplication by a scalar, magnitude of a vector, unit vectors, i, j, and k; position vectors, and the scalar product of two vectors. ● To understand perpendicular vectors, parallel vectors, the angle between two vectors, representation of a line as r=a+tb, and the angle between two lines. ● To solve the vector equation of a plane r = a+ßb+µc. ● To understand intersecting and skew lines, points of intersection, product of two vectors, and geometric interpretation.
Assessments	Daily homework, quizzes, worksheets, IB past paper questions
TOK	Vectors are used to solve many problems in position location. This can be used to save a lost sailor or destroy a building with a laser-guided bomb. To what extent does possession of knowledge carry with it an ethical obligation?

UNIT 2: Calculus (Differentiation & Integration)	
Timeframe	18 weeks
Learning goals:	● Informal ideas of limit, continuity, convergence, definition of the derivative from first principles, finding equations of tangents and normals, identifying increasing and decreasing functions; the second derivative; higher derivatives ● Derivative of x^n ; differentiation of sums and multiples of functions; the product and quotient rules ; the chain rule for composite functions ; related rates of change ; implicit differentiation ● Local maximum and minimum values ; optimization problems ; points of inflexion with zero and non-zero gradients; interpreting the graphical representation of functions including the relations between the graphs of f, f' and f''. ● Kinematic problems involving displacements, velocity v and acceleration ; total distance traveled. ● To understand indefinite integration and apply indefinite integration of sinx, cosx, e^x, 1/x. ● To understand anti-differentiation with a boundary condition. ● To apply the acceleration and velocity, areas of curves and volumes of revolution. ● To find areas under curves (between the curve and the x-axis) and areas between curves. ● Volumes of revolution. ● Differentiation of sums and multiples of functions. The product and quotient rules. The chain rule for composite functions. Related rates of change. Implicit differentiation. ● First order differential equations. ● Numerical solution of d$y = f(x, y)$ ● Variables separable.*Example*: the logistic equation d$n = kn(a-n)$, $a, k \in \mathrm{R}$

	● **Link to**: partial fractions (AHL1.11) and use of partisal fractions to rearrange the integrand (AHL5.15). ● Homogeneous differential equation d$y = f(y)$using the substitution $y = vx$. ● Maclaurin series to obtain expansions for e^x, sin$x$, cos$x$, ln$(1 + x)$, $(1 + x)_p$, $p \in$ Q. ● Use of simple substitution, products, integration and differentiation to obtain other series. ● The Maclaurin series developed from differential equations. ● **Example**: for substitution: replace x with $x2$ to define the Maclaurin series for e^x and the expansion of e^$x$sin$x$. ● The Maclaurin series developed from differential equations.
Assessments	Daily homework, quizzes, worksheets, IB past paper questions, , IB past paper questions (Exam 1)
TOK	Is mathematics independent of culture? To what extent are we people aware of the impact of culture on what we they believe or know? Consider f(x) = 1 x , 1 ≤ x ≤ ∞. An infinite area sweeps out a finite volume. Can this be reconciled with our intuition? Do emotion and intuition have a role in mathematics?

UNIT 3: Probability & Statistics & Distributions	
Timeframe	5 weeks
Learning goals:	4.1 ● Concepts of population, sample, random sample, discrete and continuous data. ● Reliability of data sources and bias in sampling. ● Interpretation of outliers. ● Sampling techniques and their effectiveness. 4.2 ● Presentation of data (discrete and continuous). ● frequency distribution (tables). ● Histograms. ● Cumulative frequency; cumulative frequency graphs; use to find median, quartiles, percentiles, range and interquartile range (IQR). ● Production and understanding of box and whisker diagrams. 4.3 ● Measures of central tendency (mean, median and mode). ● Estimation of mean from grouped data. ● Modal class. ● Measures of dispersion (interquartile range, standard deviation and variance). ● Effect of constant changes on the original data. ● Quartiles of discrete data. 4.4 ● Linear correlation of bivariate data. ● Pearson's product-moment correlation coefficient, r. ● Scatter diagrams; lines of best fit, by eye, passing through the mean point. ● Equation of the regression line of y on x. ● Use of the equation of the regression line for prediction purposes.

	● Interpret the meaning of the parameters, a and b, in a linear regression y = ax + b. ● Concepts of trial, outcome, equally likely outcomes, relative frequency, sample space (U) and event. ● The probability of an event A is P(A) = n(A)/n(U). 4.6 ● Use of Venn diagrams, tree diagrams, sample space diagrams and tables of outcomes to calculate probabilities. ● Combined events: ● P (A U B) = P(A) + P(B) – P(A B). ● Mutually exclusive events: P(A B) = 0. ● Conditional probability P(A\B) = P(A B)/ P(B). ● Independent events P(A B) = P(A)P(B). ● Concept of discrete random variables and their probability distributions. ● Expected value (mean), for discrete data. ● Binomial distribution. ● Mean and Variance of the binomial distribution. ● The normal distribution curve. ● Properties of the normal distribution. ● Diagrammatic representation. ● Normal probability calculations. ● Inverse normal calculations. ● To introduce basic concepts and help students understand and interpret the results obtained. ● To understand discrete data and continuous data. ● To understand frequency tables, presentation of data, grouped data (mid-interval values, interval width, upper and lower interval boundaries, frequency histograms), mean, median, mode, quartiles, percentiles, range, and interquartile range. ● To understand Variance, standard deviation, cumulative frequency and their graphs. ● To find median, quartiles and percentiles. ● To comprehend basic topics of probability like the relation $P(A \cup B) = P(A) + P(B) - P(A \cap B)$. ● Use of Venn Diagrams, tree diagrams and tables of outcomes to solve problems. ● Bayes' theorem. ● Apply core knowledge of probability distributions and basic statistical calculations, and to make and test hypotheses. ● Calculations of continuous random variables, binomial distributions and normal distributions.
Assessments	Daily homework, quizzes, worksheets, IB past paper questions
TOK	Does the applicability of knowledge vary across the different areas of knowledge? What would the implications be if the value of all knowledge was measured solely in terms of its applicability?

UNIT 4: General revision and preparation for IB Exams	
Timeframe	4 weeks
Learning goals:	● Revision of the past paper questions. ● Going over the topics that the students have difficulty in. ● Solutions of the IB- HL paper 1- 2 for the last three years.
Assessments	Daily homework, quizzes, worksheets, IB past paper questions (Exam 2- mock exams)

THEORY OF KNOWLEDGE (TOK)

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Course Description:

TOK is a course about critical thinking and inquiring into the process of knowing, rather than about learning a specific body of knowledge. The TOK course examines how we know what we claim to know. It does this by encouraging students to analyse knowledge claims and explore knowledge questions. A knowledge claim is the assertion that "I/we know X" or "I/we know how to Y", or a statement about knowledge; a knowledge question is an open question about knowledge.

Course Aims & Objectives:

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

Enduring Understandings:

Students will understand that:

- Our senses and memory are highly subjective and often fallible
- Arguments and conclusions can be dressed as logical but still be incorrect
- Logical fallacies are everywhere and often go unnoticed
- Emotions can be a powerful source of knowledge
- No area of knowledge is without its uncertainties, contradictions and internal debates
- Human bias and manipulation is often a root cause of unreliable data / knowledge
- Methodologies should be questioned closely

Transdisciplinary Links:

- Mathematics, Natural Sciences, The Arts

UNIT 1: Human Sciences Area of Knowledge	
Timeframe	5 weeks
Learning Goals:	● analyse the nature of knowledge (revision) ● understand the structures within which knowledge is organised in the human sciences through the knowledge framework ● examine how the 5 areas of knowledge generate and shape knowledge ● develop and sharpen skills of comparative analysis 90 ● identify and analyse the various kinds of justifications used to support knowledge claims in the human sciences ● evaluate and attempt to answer knowledge questions in the TOK essay titles ● examine AOKs' similarities and differences ● Apply essay writing skills to knowledge in the human sciences and other areas of knowledge.
Assessments:	Human Sciences Study Guide Mini TOK Essay Project Presentation

UNIT 2: Mathematics Area of Knowledge	
Timeframe	5 weeks
Learning Goals:	● analyse the nature of knowledge (revision) ● understand the structures within which knowledge is organised in mathematics through the knowledge framework ● examine how the 5 areas of knowledge generate and shape knowledge ● develop and sharpen skills of comparative analysis ● identify and analyse the various kinds of justifications used to support knowledge claims in the human sciences ● evaluate and attempt to answer knowledge questions in the TOK essay titles ● examine AOKs' similarities and differences ● Apply essay writing skills to knowledge in mathematics and other areas of knowledge.
Assessments:	Mathematics Study Guide Presentation of TOK Titles Exam

UNIT 3: TOK Essay	
Timeframe	19 weeks
Learning Goals:	● examine how the 5 areas of knowledge generate and shape knowledge ● evaluate critically the knowledge claims produced by the 5 AOKs ● compare critically the process of creating, processing, communicating and evaluating knowledge within the AOKs. ● Examining and discussing the 6 Prescribed Essay Titles in connection with the AOKs ● identify and analyse the various kinds of justifications used to support knowledge claims ● evaluate and answer knowledge questions in the TOK essay titles ● examine AOKs' similarities and differences ● write an essay in response to one of the six prescribed titles issued by the IB
Assessments:	Brainstorm Outline TOK Essay Only Draft TOK Essay Final Draft TKPPD Form Reflection Quiz Essay Performance Task 1