KNOWLEDGE & INQUIRY

SYLLABUS

Pre-University

H2

Implementation starting with
2006 Pre-University One Cohort

Ministry of Education
SINGAPORE

CONTENTS

Introduction

The report of the Junior College/Upper Secondary Education Review Committee recommended a broader and more flexible pre-university curriculum as well as a more diverse educational landscape. The pre-university curriculum should aim at developing thinking skills and engaging students in greater breadth of learning. In addition, teaching and assessment methods have to evolve, to groom and enhance in students a capacity to learn and explore independently and creatively.

This spirit of learning and exploration is embodied in the subject **Knowledge & Inquiry (KI)**. Through the inquiry process, students will investigate and evaluate the nature and construction of knowledge, developing the mental capacity to question and seek answers to observations and phenomena.

Principles of the Syllabus

KI as a subject is conceptually distinct from traditional subjects. The syllabus should not be seen as a static document. Instead, teachers and students are encouraged to engage with the syllabus and construct a learning experience that is meaningful for themselves. The KI syllabus emphasises learner- centredness, negotiated learning and spiral progression.

- *Learner-centredness*
  The student is at the centre of the learning process. The syllabus hinges on the principle that the learning that is to take place meets the needs and abilities of the students. Students should be given opportunities to confront new information and experiences in the search for meaning. These opportunities need to be provided in ways that will allow students to do more than receive information from the teacher.

- *Negotiated Learning*
  The KI syllabus encourages and allows both teachers and students to negotiate what they are learning. The syllabus encourages teachers and students to work together to decide the areas of exploration as they explore the concepts related to the nature and construction of knowledge. In this way both teachers and students would be engaged in the process of inquiry. This encourages ownership of the learning process and independent learning.

- *Spiral Progression*
  Spiral progression is a key principle of the syllabus as the concepts and process skills will be explored and applied at increasing levels of difficulty. As the process of inquiry becomes more sophisticated and greater content knowledge is acquired, issues which were previously explored may be re-visited and fresh perspectives gained.

Syllabus Structure

KI as a subject focuses on students asking questions: about themselves, their society, the world around them, and exploring the different possible answers to these questions. It is in this spirit of inquiry that the syllabus is structured.

Syllabus Design Features

What is KI and why has it been introduced?	Statement about the subject and its rationale
What does KI aim to do?	Learning Outcomes
What is the coverage of KI?	Content/Skills
How can KI be learnt?	Pedagogy and Resources
How will KI be assessed?	Assessment Framework

What is KI and why has it been introduced?

Subjects studied in schools are social constructs that reflect the patterns of social relationships, value systems and ideologies within a society at particular points in time. Given the knowledge-driven nature of modern societies, it is important for students to gain a better understanding of the nature and construction of knowledge, and apply this understanding to the different areas of knowledge they may be engaged in. It is to address this need that KI was introduced into the pre-university curriculum.

KI is a subject that focuses on the nature of knowledge and its construction in areas such as the sciences, the social sciences, mathematics and aesthetics. This forms the core knowledge of KI. Students will be engaged in critically evaluating what is regarded as knowledge in the context of particular disciplines. A theoretical understanding of the nature and construction of knowledge will have to be applied in different areas of study.

KI is aimed at developing in students, via the process of inquiry, the skills and attributes that will enable them to understand the construction of knowledge. KI students will explore the strengths and limitations of such constructions, the ethical dimensions to the construction and use of knowledge, and acquire the critical faculty to apply the knowledge they have gained responsibly and meaningfully.

KI students will develop a sense of global identity that is grounded in a strong sense of social responsibility. KI students will be motivated to explore issues of both global and local concern. KI students will develop a keen appreciation of values and beliefs and an understanding of their roles and responsibilities within their societies.

What does KI aim to do?

The following statements articulate the learning outcomes of KI.

LO1 *KI students will develop an understanding of the nature of knowledge*

KI students will be exposed to a range of views on the nature of knowledge. KI students will be able to balance a theoretical understanding of the nature of knowledge with the practical ability to apply such knowledge. KI students will understand the traditional classifications of knowledge as well as be capable of questioning these classifications.

LO2 *KI students will develop an understanding of the ways of constructing knowledge in the different fields*

KI students will develop an understanding of the different modes of inquiry in fields like the sciences, the humanities, mathematics and the aesthetics. 'Modes of inquiry' refers to the different ways in which knowledge is constructed in the different fields. KI students will explore key areas of knowledge in these fields and consider how the ways of knowledge construction may differ.

LO3 *KI students will develop critical thinking skills*

KI students should be able to analyse and critique information and arguments, and determine their validity in a reasoned and substantiated manner. KI students should be capable of reflecting on their own thinking processes and demonstrate an awareness of how these processes could be improved.

LO4 *KI students will develop an awareness of the ethical dimensions of knowledge construction*

KI students will develop the ability to understand that the construction of knowledge involves ethical considerations, and be aware of these considerations. They should understand that knowledge is constructed in an ethical context and involves issues dealing with the link between knowledge and power, the use of knowledge in society and the ethical boundaries of inquiry.

LO5 *KI students will develop a capacity for independent learning*

KI students will develop the ability to define their own learning and the faculty to think independently. They will be able to conduct independent research and reflect on the research process, developing research and analytical skills.

LO6 *KI students will develop an ability to communicate clearly and convincingly*

KI students will develop the ability to articulate and defend effectively their ideas and arguments.

What is the coverage of KI?

Framework of Key Questions

Students will be encouraged to ask a series of fundamental questions and explore possible answers to these questions. The questions do not constitute distinct boundaries in knowledge: each question will necessarily redefine previous questions and answers in a spiral progression, enabling students to better understand the issues explored.

The areas of exploration within each key question are the issues that will prompt the process of inquiry, which leads students to gain knowledge in particular fields. As students become familiar with and interested in a topic or issue and engage in further inquiry, previous areas of exploration are likely to be revisited. This spiral approach ensures that students continue to practise, apply and even rethink what they have learnt.

Key Question	Areas of Exploration
Why ask questions?	Students explore asking questions as central to the process of inquiry. Students start the course by evoking their natural curiosity about the world around them. Asking questions is often the first step towards knowledge creation. Students begin questioning the fundamentals of knowledge they normally take for granted. Types of questions for students to explore: • **Logical** • **Ethical** • **Epistemological** • **Metaphysical** • **Aesthetic** Students explore the differences in the types of questions as well as the differences in the answers to these questions. Students explore the link between finding answers to these questions and the process of inquiry. Process of inquiry: observation, description, questioning, constructing possible answers, 'testing out' answers. This could lead to different classifications of knowledge which will be covered later in the syllabus. Students explore models of questioning, like Socratic questioning, as a way of exploring knowledge.

Key Question	Areas of Exploration
What is knowledge?	This question is central to KI as it constitutes a large section of the 'core' of the subject. Knowledge is often seen as that which we believe to be true. This is often derived from our sensory perceptions, what others tell us, what we read about and our mental processes. Students explore the different types of knowledge: • **personal, common sense knowledge** • **cultural knowledge** • **academic knowledge** Students explore what counts as knowledge and what the differences between the different types of knowledge are, including possible differences between perceptual and academic knowledge. Students explore why academic knowledge is often valued above other types of knowledge in today's world. Students explore the differences between the different types of academic knowledge. Students explore how knowledge is viewed differently over time.

Key Question	Areas of Exploration
How is knowledge constructed? (Part One)	The process of knowledge construction is not an objective one that takes place in a vacuum. Students should come to the awareness that the process of knowledge construction is a non-linear, ongoing process consisting of creating, building, demolishing and rebuilding ideas/thoughts. Students explore the fundamentals of knowledge construction in areas like the sciences, the social sciences, mathematics and aesthetics: • **Modes of Inquiry** Refers to 'ways of constructing knowledge'. The emphasis is on students exploring the nature of knowledge, ways in which knowledge is constructed, learning to construct knowledge, working with others to find answers and using critical thinking skills to evaluate ideas. • **the Deductive and Inductive approaches** Deductive reasoning refers to the process of taking a known idea or theory and applying it to a situation. Often no new semantic meaning is created. Inductive reasoning refers to using an observation to formulate a theory or idea. Often, new semantic information is created.

Key Question	Areas of Exploration
How is knowledge constructed? (Part Two)	• **scientific inquiry** Students explore the basis of scientific knowledge obtained through apparently objective observations and inductive reasoning. Ideas of the scientific process, experimentation, knowledge claims and conjectures are explored. • **mathematical inquiry** Students explore the basis of mathematical knowledge obtained through deductive reasoning building from clearly stated assumptions and arriving at systematic conclusions through a process of rigorous logic. • **social science inquiry** Students explore the basis of social science knowledge which often is constructed from inductive reasoning. Students explore the possible differences between this and scientific inquiry and the major investigative approaches in this inquiry. • **aesthetic inquiry** Students explore the basis of aesthetic knowledge which often is constructed from justified subjective propositions. Students explore the role of knowledge claims and opinions in the construction of aesthetic knowledge.

What makes knowledge valid? (Part One)	Students explore what it means to say that knowledge is 'valid' and explore applications of ideas of validity. Students explore concepts related to the validity of knowledge: • **facts, argument, reasoning and logic** Students explore the basis and status of facts, the nature and types of arguments, the types of reasoning and informal logic (as opposed to formal logic which uses a formal, mathematical system). • **rationalism** This is largely based on the belief that knowledge is acquired mainly through the use of reason. Sensory perceptions are largely viewed as unreliable. Scientific logic is seen as important in knowledge construction. • **empiricism** This is largely based on the view that reality is derived ultimately from what we experience through our senses. Emphasis is placed on observation and the checking of general ideas against experience.

Key Question	Areas of Exploration
What makes knowledge valid? (Part Two)	• **methodology in the different fields of knowledge** Students explore the ways in which knowledge is constructed in the different fields of knowledge. • **questioning sources of knowledge and authorship** Students explore and question the different sources of knowledge and the concept of credibility. • **the subjective inquirer** Students explore the role of the subjective inquirer in the different fields of knowledge and consider the extent this role differs. Students examine their own biases and limitations as inquirers in different fields of knowledge. Students explore the different motivations of knowledge inquirers and how these affect the processes of knowledge constructions. • **conflict between different fields of knowledge** Students explore the possible conflicts between the different fields of knowledge, considering the fundamental differences in the way knowledge is constructed in these fields and how this could result in different conclusions being drawn.

How is knowledge affected by society?	Students explore the relationship between knowledge and the knower. The knower is integrally tied in with the society and the various constructs that affect that society. Students explore constructs in knowledge creation: • **belief structures** Students explore how belief structures affect knowledge creation in the different fields. Students will consider how constructs like national identity, religion, race and ethnicity affect individuals, and consequently their position in the construction of knowledge. • **Western and Eastern constructions of knowledge** Students explore differences and similarities in Western and Eastern views on knowledge construction. These include the generally more philosophical nature of Eastern knowledge, the contact between the two traditions and the role of power in the ascendancy of Western ideas. • **gender** Students explore notions of gender, moving from physiological considerations to social and philosophical considerations in different societies and how these affect individuals and societies as a whole. • **shared historical background** Students explore ideas related to history, heritage and shared identity and how these concepts affect individuals and societies. • **political constructs** Students explore concepts related to political constructs and how these affect the construction of knowledge. These constructs include kingship, democracy and socialism.

Key Question	Areas of Exploration
How should knowledge be used?	Students explore issues related to the management and use of knowledge in particular contexts. Students explore the control of knowledge in society and the power structures within it. Students explore the role played by ethics: • **the question of ethics in society** Students discuss definitions of ethics in society as they explore the relationship between individual choice and societal constraints. Concepts like free will, determinism, morality, utilitarianism and natural law could be explored. • **the ethics of inquiry** Students explore the place of ethics in the different forms of inquiry. Specific applications like medical ethics and feminist issues would be explored. Students explore issues related to the ethical use of knowledge. This includes exploring whether there is an inherent ethical dimension in knowledge construction, or whether it is only the use/misuse of knowledge that can be considered in ethical terms. • **knowledge and power** Students explore the relationship between the exercise of power and the construction of knowledge. Students explore different aspects of the exercise of power in knowledge management at various levels. Students could explore the different kinds of power when applied to knowledge from 'soft' power of influence and persuasion (eg. advertising, cultural imperialism) to knowledge translated into 'hard' power (eg. weapons technology).

How can KI be learnt?

The KI syllabus encourages students and teachers to discuss what and how the key questions and areas of exploration can be explored in terms of sequence and depth of focus. The syllabus should be constructed around the interests and abilities of students to meet the learning and assessment objectives of the subject in a learner-centred learning environment.

The Role of the Teacher

- *Create a Learner-Centred Experience*
  In the KI classroom the teacher acts as a facilitator, resource person and model of learning. The teacher needs to anticipate the needs of the students and develop activities to meet these needs. Activities should be planned around the different interests of the students and lesson design should tap on students' prior knowledge.

- *Establish a Conducive Learning Environment*
  The teacher is also instrumental in creating a positive and supportive learning environment in the classroom. The process of inquiry requires the establishment of a non-threatening learning environment where students are able to question ideas, beliefs and norms.

- *Developing the KI Teacher*
  To prepare themselves for such roles, teachers are encouraged to become more knowledgeable about theories and methods of instruction. Besides the formal training sessions arranged to prepare them to deliver the syllabus, KI teachers should engage in wide reading on the areas of exploration. Meeting fellow KI teachers, whether formally or informally, also provides an opportunity for discussion and sharing of ideas and pedagogies.

The Role of the Student

- *Be Active Learners*
  The KI classroom allows students some degree of control to negotiate and define what they want to learn. KI students will engage in exploring issues that interest them. They will be active learners who challenge and question fundamental assumptions about knowledge constructs.

- *Be Empowered Learners*
  KI students will be empowered and highly-motivated learners who are able to articulate and define their learning. They are thus responsible for their own learning experiences. They would also have the opportunity to delve into areas they are passionate about and articulate their views on these areas.

Learning Approaches

To ensure that the learning outcomes are achieved, a variety of learning approaches could be made available to students. This includes the following:

- Access to read extensively from a variety of sources, including classic and contemporary texts on the areas of exploration.
- Access to learning media such as videos, films and digital data.
- Field trips for experiential learning.
- Talks/symposiums to enrich students' learning experiences.
- Ample opportunities to articulate and defend their ideas both in written and oral communication.
- Autonomy and independence as knowledge inquirers in the different fields.

How will KI be assessed?

The formal assessment framework for KI comprises:

- *Written examinations*
  These will assess the students' understanding of the theoretical concepts and their application of these concepts, and their critical thinking skills.

- *Coursework*
  This will engage students in an independent study or investigation in an area of their interest.

Assessment Objectives

AO1 *Understanding the Nature and Construction of Knowledge*
Candidates will be expected to demonstrate their understanding of the nature and construction of knowledge. They will be expected to demonstrate knowledge and understanding of the areas of exploration of the syllabus. They will be expected to show that they have read widely and have understood and can apply the concepts involved. Candidates will be expected to demonstrate skill in selecting relevant material with which to tackle the assessment tasks.

AO2 *Critical Thinking*
Candidates will be expected to demonstrate skills of critical thinking. They will be expected to analyse different kinds of arguments and information, identify and evaluate assumptions and points of view, verify claims and provide reasoned and supported arguments of their own.

AO3 *Communication*
Candidates will be expected to demonstrate their ability to communicate their ideas and arguments clearly and coherently in good English. They will be expected to structure their arguments and select an appropriate style of presentation. They will be expected to communicate responses that are fully relevant to the questions asked and demonstrate clear ability to engage with different aspects of these questions.

Assessment Mode

There will be 3 assessment components:

Paper	Title	Duration	Period of Assessment	Marks
1	Essay	3 hours	End-of-year examinations	60
2	Critical Thinking	2 hours	End-of-year examinations	60
3	Independent Study	6 months	Feb to Aug (2nd year JC/3rd year CI)	80
			Total	**200**

Paper 1 – Essay

Questions will be set on the areas of learning identified in the content coverage of the subject. Candidates will write **two** 1000 – 1200 word essays, **one** from each section, in a 3-hour paper. Section A will cover the theoretical aspects of areas of exploration. Students will choose one out of two questions. Section B will cover the application of areas of exploration. Students will choose one out of four questions.

Candidates will be assessed on their ability to:

- demonstrate an understanding of the nature and construction of knowledge and how knowledge is constructed in the various fields
- apply their broader understanding of the nature and construction of knowledge to address specific contexts as required by the questions
- select appropriate material from the content of the syllabus and apply it effectively to address the questions
- refer to readings they have undertaken and use them to support the argument presented
- use language appropriately and effectively to communicate a clear and well structured argument

Paper 2 – Critical Thinking

This 2-hour paper gives candidates the opportunity to demonstrate critical thinking skills by applying their knowledge and understanding of what they have studied to unseen stimulus material. The paper is divided into two sections: Sections A and B.

Section A comprises one passage on an area related to the nature and construction of knowledge. The passage is followed by one compulsory question.

Candidates will be assessed on their ability to:

- demonstrate an understanding of the nature and construction of knowledge in their critical analysis of the arguments, information and views presented in the text
- apply their broader understanding of the nature and construction of knowledge to address specific contexts as required by the question
- use language appropriately and effectively to communicate a clear and well structured argument

Section B will present candidates with a variety of texts and candidates will be assessed on their ability to:

- critically analyse different kinds of arguments and information presented in the material
- identify and evaluate assumptions and points of view, verify claims
- provide reasoned and supported arguments

Paper 3 - Independent Study

This paper gives candidates the opportunity to select a topic of their choice related to an area of the nature and construction of knowledge outlined in the syllabus that they have studied and carry out independent research on that topic. The selected topic must be focused and suitable for an in-depth study of 6 months' duration and candidates' proposals must be submitted for approval before the study is embarked on.

Candidates will be assessed on their ability to:

- demonstrate their understanding of the nature and construction of knowledge as it relates to their chosen area of study
- apply their understanding of the nature and construction of knowledge in addressing the specific context of their chosen area of study
- select appropriate material from the areas of coverage of the syllabus in addressing their chosen area of study
- show that they have engaged in relevant reading during the course of their research by presenting a literature review and applying what they have read to support the arguments they present
- use language appropriately and effectively to communicate a clear and well structured argument