



**SCOTS
COLLEGE**
Learning. For Life



IB Environmental Systems and Societies Handbook & Course Guide 2014 – 2015

Name: _____

IB mission statement

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

To this end the organization works with schools, governments and international organizations to develop challenging programmes of international education and rigorous assessment.

These programmes encourage students across the world to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right.

IB learner profile

The aim of all IB programmes is to develop internationally minded people who, recognizing their common humanity and shared guardianship of the planet, help to create a better and more peaceful world.

IB learners strive to be:

Inquirers They develop their natural curiosity. They acquire the skills necessary to conduct inquiry and research and show independence in learning. They actively enjoy learning and this love of learning will be sustained throughout their lives.

Knowledgeable They explore concepts, ideas and issues that have local and global significance. In so doing, they acquire in-depth knowledge and develop understanding across a broad and balanced range of disciplines.

Thinkers They exercise initiative in applying thinking skills critically and creatively to recognize and approach complex problems, and make reasoned, ethical decisions.

Communicators They understand and express ideas and information confidently and creatively in more than one language and in a variety of modes of communication. They work effectively and willingly in collaboration with others.

Principled They act with integrity and honesty, with a strong sense of fairness, justice and respect for the dignity of the individual, groups and communities. They take responsibility for their own actions and the consequences that accompany them.

Open-minded They understand and appreciate their own cultures and personal histories, and are open to the perspectives, values and traditions of other individuals and communities. They are accustomed to seeking and evaluating a range of points of view, and are willing to grow from the experience.

Caring They show empathy, compassion and respect towards the needs and feelings of others. They have a personal commitment to service, and act to make a positive difference to the lives of others and to the environment.

Risk-takers They approach unfamiliar situations and uncertainty with courage and forethought, and have the independence of spirit to explore new roles, ideas and strategies. They are brave and articulate in defending their beliefs.

Balanced They understand the importance of intellectual, physical and emotional balance to achieve personal well-being for themselves and others.

Reflective They give thoughtful consideration to their own learning and experience. They are able to assess and understand their strengths and limitations in order to support their learning and personal development.

The Nature of this subject

As a trans-disciplinary subject, environmental systems and societies is designed to combine the techniques and knowledge associated with group 4 (the experimental sciences) with those associated with group 3 (individuals and societies). By choosing to study a trans-disciplinary course such as this as part of their diploma, students are able to satisfy the requirements for both groups 3 and 4 of the hexagon, thus allowing them to choose another subject from any hexagon group (including another group 3 or 4 subject). Trans-disciplinary subjects therefore introduce more flexibility into the IB Diploma Programme.

The environmental systems and societies course is offered at SL only.

The prime intent of this course is to provide students with a coherent perspective of the interrelationships between environmental systems and societies; one that enables them to adopt an informed personal response to the wide range of pressing environmental issues that they will inevitably come to face. Students' attention can be constantly drawn to their own relationship with their environment and the significance of choices and decisions that they make in their own lives. It is intended that students develop a sound understanding of the interrelationships between environmental systems and societies, rather than a purely journalistic appreciation of environmental issues. The teaching approach therefore needs to be conducive to students evaluating the scientific, ethical and socio-political aspects of issues.

The international dimension

Environmental issues are both local and global in their extent. This course reflects the **International element** throughout but, where it may be drawn particularly to the attention of the students, this is highlighted alongside some assessment statements (**Int**).

We all live on one planet Earth, yet use much more than one planet Earth's worth of resources. This is obviously not sustainable and this course attempts to discuss the issues surrounding resource use at various scales—from that of the individual (for example, attitudes to recycling) to that of the global community (aims 1, 2, 6 and 8 in particular).

Internationally, both governmental and non-governmental environmental organizations are considered in the course, from the United Nations Environment Programme (UNEP) to Greenpeace and the World Wide Fund for Nature (WWF).

Environmental Scientists work internationally at all levels. In this course, students may share data collected with those in other IB Diploma Programme schools on other continents just as professional scientists pool their data. Students taking this course should thus become more aware of the diversity of cultural perspectives on the environment (aim 4) and appreciate that environmental issues may be controversial as they cross geographical and cultural boundaries (aim 7).

Prior learning

Students will be able to study this course successfully with no specific previous knowledge of science or geography. However, as the course aims to foster an international perspective, awareness of local and global environmental concerns and an understanding of the scientific method, a course that shares these aims would be good preparation.

Mathematical requirements

All Diploma Programme Environmental Systems and Societies students should be able to:

- perform the basic arithmetic functions: addition, subtraction, multiplication and division
- use simple descriptive statistics: mean, median, mode, range, frequency, percentages, ratios, approximations and reciprocals
- use standard notation (for example, 3.6×10^6)
- use direct and inverse proportion
- interpret frequency data in the form of bar charts, column graphs and histograms, and interpret pie charts
- understand the significance of the standard deviation of a set of data
- plot and sketch graphs (with suitable scales and axes)
- interpret graphs, including the significance of gradients, changes in gradients, intercepts and areas
- demonstrate sufficient knowledge of probability (for example, in assessing risks in environmental impact).

Environmental systems and societies and theory of knowledge

This course offers some excellent opportunities for approaching issues of knowledge in immediate and practical contexts. The systems approach itself, which is employed throughout the syllabus, raises some interesting points of comparison and contrast with conventional models of the scientific method. It is essentially holistic rather than reductionist. While this approach is frequently quantitative in its representation of data, it also addresses the challenge of handling a wide range of qualitative data. There are many checks and guidelines to ensure objectivity in data handling and interpretation but the standards of objectivity may not always be so rigorously controlled as they are in the purely physical sciences. Furthermore, as a trans-disciplinary subject, the material addressed frequently lies astride the interface of what are perceived as clear subject boundaries. In exploring and understanding an environmental issue, one must be able to integrate the hard, scientific, quantitative “facts” with the qualitative value judgments of politics, sociology and ethics. All this makes particularly fertile ground for discussions related to theory of knowledge (TOK).

Environmental systems and societies aims

The systems approach provides the core methodology of this course. It is amplified by other sources, such as economic, historical, cultural, socio-political and scientific, to provide a holistic perspective on environmental issues.

The aims of the **Environmental Systems and Societies** course are to:

1. Promote understanding of environmental processes at a variety of scales, from local to global
2. Provide a body of knowledge, methodologies and skills that can be used in the analysis of environmental issues at local and global levels
3. Enable students to apply the knowledge, methodologies and skills gained
4. Promote critical awareness of a diversity of cultural perspectives
5. Recognize the extent to which technology plays a role in both causing and solving environmental problems
6. Appreciate the value of local as well as international collaboration in resolving environmental problems
7. Appreciate that environmental issues may be controversial, and may provoke a variety of responses
8. Appreciate that human society is both directly and indirectly linked to the environment at a number of levels and at a variety of scales.

Objectives

The objectives reflect those parts of the aims that will be assessed. It is the intention of the **environmental systems and societies** course that students should achieve the following objectives.

1. Demonstrate an understanding of information, terminology, concepts, methodologies and skills with regard to environmental issues.
2. Apply and use information, terminology, concepts, methodologies and skills with regard to environmental issues.
3. Synthesize, analyse and evaluate research questions, hypotheses, methods and scientific explanations with regard to environmental issues.
4. Using a holistic approach, make reasoned and balanced judgments using appropriate economic, historical, cultural, socio-political and scientific sources.
5. Articulate and justify a personal viewpoint on environmental issues with reasoned argument while appreciating alternative viewpoints, including the perceptions of different cultures.
6. Demonstrate the personal skills of cooperation and responsibility appropriate for effective investigation and problem solving.
7. Select and demonstrate the appropriate practical and research skills necessary to carry out investigations with due regard to precision.

Course Weighting

Standard Level Assessment		
External Assessment		80%
Written Papers		
Paper 1	Short-answer and data-based questions	30%
Paper 2	Section A: case study Section B: two structured essay questions (from a choice of four)	50%
Internal Assessment		20%

Syllabus Outline

Syllabus Component
Topic 1: Systems and models
Topic 2: The ecosystem 2.1 Structure 2.2 Measuring abiotic components of the system 2.3 Measuring biotic components of the system 2.4 Biomes 2.5 Function 2.6 Changes 2.7 Measuring changes in the system
Topic 3: Human population, carrying capacity and resource use 3.1 Population dynamics 3.2 Resources—natural capital 3.3 Energy resources 3.4 The soil system 3.5 Food resources 3.6 Water resources 3.7 Limits to growth 3.8 Environmental demands of human populations
Topic 4: Conservation and biodiversity 4.1 Biodiversity in ecosystems 4.2 Evaluating biodiversity and vulnerability 4.3 Conservation of biodiversity
Topic 5: Pollution management 5.1 Nature of pollution 5.2 Detection and monitoring of pollution 5.3 Approaches to pollution management 5.4 Eutrophication 5.5 Solid domestic waste 5.6 Depletion of stratospheric ozone 5.7 Urban air pollution 5.8 Acid deposition
Topic 6: The issue of global warming
Topic 7: Environmental value systems

Two Year Plan for IB Diploma EVS

This is a proposed plan of work for the two year course. It is subject to change.

Hours	Topic/Option	Name	Weeks
Year One			
Term 1			
5 hours	Topic 1	Systems and Models	1 weeks
31 hours	Topic 2	The Ecosystem	9 weeks
Term 2			
	Topic 2	The Ecosystem cont...	3 weeks
		?? IA practise	
39 hours	Topic 3	Human Population, carrying capacity and resource use	6 weeks
Term 3			
	Topic 3	Human Population, carrying capacity and resource use cont.....	9 weeks
15 hours	Topic 4	Conservation and Biodiversity	1 weeks
		Practical work	
Term 4			
		School Exams	1 week
		Internal Work	1 week
15 hours	Topic 4	Conservation and Biodiversity	4 weeks
		Alternative timetable	2 weeks
10 hours		Group 4 Project	2 days
Year Two			
Term 1			
18 hours	Topic 5	Pollution Management	6 weeks
6 hours	Topic 6	The issue of global warming	4 weeks
Term 2			
6 Hours	Topic 7	The Environmental Values System	4 weeks
Term 3			
		Revision	
		Mock exams	
Term 4			
		Revision	
		IB Examinations	

IB Diploma (SL) Environmental Systems & Societies (EVS)

	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	
Jan	Summer Holiday																												Topic 1 - Systems		Jan
Feb	Topic 1 - Systems & Models										Topic 2 - The Ecosystem										Feb										
Mar	Topic 2 - The Ecosystem																												Summer Tournament Week		Mar
Apr	EOTC week			Topic 2 - The Ecosystem										Easter Holiday										Apr							
May	Topic 2 - The Ecosystem																												May		
Jun	Geo - TVC Fieldtrip										Geo - Rotorua										Jun										
Jul	Topic 3 - Human Population, Carrying Capacity and Resource use										Winter Holiday										Jul										
Aug	Topic 3 - Human Population, Carrying Capacity and Resource use																												Aug		
Sep	Winter Tournament Week										Topic 3 - Human Population, Carrying Capacity and Resource use										Spring Holiday		Sep								
Oct	Founder's Break			Spring Holiday										Topic 3 - Human Population, Carrying Capacity and Resource use										Oct							
Nov	Topic 4 - Conservation and Biodiversity																												Nov		
Dec	MS & College Prize giving										Prep Prize giving										Summer Holiday										Dec