Dawood Public School
Course Outline 2017-2018
Environmental Management
Class X

Syllabus Code: 5014

1. Syllabus

The syllabus is divided into nine topics which have been designed to develop an understanding of both the natural and the human environment:

1. Rocks and minerals and their exploitation
2. Energy and the environment
3. Agriculture and the environment
4. Water and its management
5. Oceans and fisheries
6. Managing natural hazards
7. The atmosphere and human activities
8. Human population
9. Natural ecosystems and human activities

2. Assessment at a glance

Component	Weighting
Paper 1 Theory 1 hour 45 minutes The paper will consist of two sections: **Section A** Short-answer and structured questions. (20 marks) **Section B** Short-answer and extended response questions based on related source material. (60 marks) 80 marks	**50%**

Component	Weighting
Paper 2 Management in context 1 hour 45 minutes A written paper consisting of short-answer, data processing and analysis, and extended response questions based on source material. Candidates will be expected to make use of information from the source material to help illustrate issues of environmental management. 80 marks	**50%**

3. Syllabus aims

The aims below describe the educational purposes of a course in Environmental Management for the Cambridge O Level examination. They are not listed in order of priority.

The aims are to enable candidates to acquire:

- knowledge of natural systems which make life possible on Earth
- an understanding that humans are part of these systems and depend on them
- an appreciation of the diverse infl uences of human activity on natural systems

- an awareness of the need to manage natural systems
- an understanding of sustainable development to meet the needs of the present, without compromising the ability of future generations to meet their own needs
- a sense of responsibility and concern for the welfare of the environment and all organisms
- an awareness of their own values concerning environmental issues
- an awareness of the values of others
- a willingness to review their own attitudes in the light of new knowledge and experiences
- a sound basis for further study, personal development and participation in local and global environmental concerns.

4. Assessment objectives

The assessment objectives (AOs) are:

AO1 Knowledge and understanding

AO2 Information handling and analysis

AO3 Investigation skills and making judgements.

AO1 Knowledge and understanding

Candidates should be able to demonstrate knowledge and understanding, in familiar and unfamiliar contexts, of:

1. phenomena, facts, definitions, concepts and theories
2. vocabulary, terminology and conventions
3. technological applications with their social, economic and environmental implications.

AO2 Information handling and analysis

Candidates should be able, in words or using other forms of presentation (e.g. graphical or numerical), in
familiar and unfamiliar contexts, to:

1. locate, select, organise and present information from a variety of sources
2. translate information and evidence from one form to another
3. manipulate numerical data
4. interpret and evaluate data, report trends and draw inferences.

AO3 Investigation skills and making judgements

Candidates should be able, in familiar and unfamiliar contexts, to:

1. plan investigations
2. identify limitations of methods and suggest possible improvements
3. present reasoned explanations for phenomena, patterns and relationships
4. make reasoned judgements and reach conclusions based on qualitative and quantitative information.

5. Syllabus content

Topic	Candidates should be able to	Further guidance and exemplification
FIRST TERM		
Chapter 7 The atmosphere and human activities		
7.1 The atmosphere	• describe the structure and composition of the atmosphere • describe the natural greenhouse effect	• troposphere, stratosphere, mesosphere, thermosphere • nitrogen, oxygen, carbon dioxide, argon, water vapour • the ozone layer
7.2 Atmospheric pollution and its causes	• describe and explain the causes of atmospheric pollution, with reference to: – smog – acid rain – ozone layer depletion – enhanced greenhouse effect	• smog: volatile organic compounds (from industrial processes), vehicle emissions, impact of temperature inversion • acid rain: sulfur dioxide and oxides of nitrogen • ozone layer depletion: action of chlorofl uorocarbons (CFCs) • enhanced greenhouse effect: greenhouse gases (carbon dioxide, water vapour and methane)
7.3 Impact of atmospheric pollution	• describe and explain the impact of atmospheric pollution	• smog: effects on human health • acid rain: 3inimiz cation of bodies of water, effects on fi sh populations, damage to crops and vegetation, damage to buildings • ozone depletion: higher levels of ultraviolet radiation reaching the Earth's surface, increased rates of skin cancer and cataracts, damage to vegetation • climate change: melting of ice sheets, glaciers and permafrost; rise of sea-level; fl ooding and loss of land; forced migration
7.4 Managing atmospheric pollution	• describe and explain the strategies used by individuals, governments and the international community to reduce the effects of atmospheric pollution	• reduction of carbon footprint • reduced use of fossil fuels • energy efficiency • carbon capture and storage • transport policies • international agreement and policies • CFC replacement • catalytic converters • fl ue-gas 3inimizing3tion • taxation • reforestation and afforestation
Case study: • Study the causes, impact and management of a specifi c example of atmospheric pollution.		

Chapter 2 Energy and the environment		
2.1 Fossil fuel formation	• describe the formation of the fossil fuels: coal, oil and gas	
2.2 Energy resources and the generation of electricity	• classify the following energy resources as non-renewable or renewable: fossil fuels, nuclear power, biofuels, geothermal power, hydro-electric power, tidal power, wave power, solar power, wind power • describe how each of these energy resources is used to generate electricity • describe the environmental, economic and social advantages and disadvantages of each of these energy resources	• non-renewable: fossil fuels, nuclear power using uranium • renewable: biofuels (bioethanol, biogas and wood), geothermal power, hydro-electric power, tidal power, wave power, solar power, wind power
2.3 Energy demand	• describe and explain the factors affecting the demand for energy	• domestic demand • industrial demand • transport • personal and national wealth • climate
2.4 Conservation And management of energy resources	• describe and explain strategies for the efficient management of energy resources • research and development of new energy resources	• reducing consumption, such as using insulation, turning electrical devices off and using energy effi cient devices and vehicles • energy from waste cooking oil • exploiting existing energy sources • education of people for energy conservation • transport policies • fracking
2.5 Impact of oil pollution	• describe the causes and impacts of oil pollution on marine and coastal ecosystems	• causes: off-shore oil extraction, pipelines and shipping • impacts on ecosystems: birds, marine mammals, coral reefs, beaches
2.6 Management of oil pollution	• discuss strategies for reducing oil spills in marine and coastal ecosystems • discuss strategies for 4 inimizing the impacts of oil spills on the marine and coastal ecosystems	• MARPOL (International Convention for the Prevention of Pollution from Ships) • double-hulled oil tankers • dealing with oil spills (booms, detergent sprays, skimmers)
Case study: • Study the impact and management of an oil pollution event.		

SECOND TERM		
Chapter 3 Agriculture and the environment		
3.1 Soil composition	• describe and explain the composition of soils	• composition: mineral particles, organic content (living plants, animals, microorganisms and their dead remains), air and water • particle size: sand, silt, clay
3.2 Soils for plant growth	• describe soils as a medium for plant growth • describe the differences between a sandy and clay soil	• mineral ions: nitrogen as nitrate ions (NO^{3-}), phosphorus as phosphate ions ($PO4^{3-}$), potassium as potassium ions (K+) • organic content • pH • air content • water content • drainage • ease of cultivation
3.3 Agriculture types	• describe the different types of agriculture	• arable, pastoral and mixed • subsistence and commercial
3.4 Increasing agricultural yields	• describe techniques used to increase agricultural yields	• rotation • fertilisers • irrigation • insect control (insecticide and biological control), weed control (herbicide), fungi control (fungicide) • mechanisation • selective breeding of animals and plants • genetically modifi ed organisms • controlled environments: greenhouses and hydroponics
3.5 Impact of agriculture	• describe and explain the impact of agricultural practices on the environment and people	• overuse of insecticides and herbicides • overuse of fertilisers • mismanagement of irrigation causing salinisation and waterlogging • overproduction and waste • exhaustion of mineral ion content • soil erosion • cash crops replacing food crops
3.6 Causes and impacts of soil erosion	• describe the causes of soil erosion • describe and explain the impacts of soil erosion	• removal of natural vegetation by over cultivation and overgrazing • water and wind erosion • loss of habitats • desertifi cation • silting of rivers • displacement of people • malnutrition and famine

3.7 Managing soil erosion	• describe and explain strategies to reduce soil erosion	• terracing • contour ploughing • bunds • wind breaks • maintaining vegetation cover • addition of organic matter to improve soil structure • planting trees, mixed cropping, intercropping and crop rotation
3.8 Sustainable agriculture	• describe and explain strategies for sustainable agriculture	• organic fertiliser (crop residue, manure) • managed grazing (livestock rotation) • crop rotation • use of pest resistant and drought resistant varieties of crops • trickle drip irrigation • rainwater harvesting
Case study: • Study an example where agriculture has had severe environmental consequences including soil erosion and strategies for the conservation of the soil.		

Monthly Syllabus

Term	Months	Contents	Topics
FIRST TERM	August	Chapter 7 The atmosphere and human activities	7.1 The atmosphere 7.2 Atmospheric pollution and its causes
	September	Chapter 7 (Continued)	7.3 Impact of atmospheric pollution 7.4 Managing atmospheric pollution
	October	Chapter 2 Energy and the environment	2.1 Fossil fuel formation 2.2 Energy resources and the generation of electricity 2.3 Energy demand
	November	Chapter 2 (Continued)	2.4 Conservation and management of energy resources 2.5 Impact of oil pollution 2.6 Management of oil pollution
	END OF November till Decemeber	MIDYEAR EXAMINATION	
SECOND TERM	January	Chapter 3 Agriculture and the environment	3.1 Soil composition 3.2 Soils for plant growth 3.3 Agriculture types 3.4 Increasing agricultural yields
	February	Chapter 3 (Continued)	3.4 (Continued) 3.5 Impact of agriculture 3.6 Causes and impacts of soil erosion
	March	Chapter 3 (Continued)	3.7 Managing soil erosion 3.8 Sustainable agriculture
	March-April	FINAL EXAMINATION	