

**Dawood Public School**  
**Course Outline 2019-2020**  
**Cambridge O Level Environmental Management 5014**  
**Grade X**

**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

**Assessment at a glance**

<b>Component</b>	<b>Weighting</b>
<p><b>Paper 1 Theory</b> <span style="float: right;"><b>1 hour 30 minutes</b></span></p> <p>The paper will consist of two sections:</p> <p><b>Section A</b> Short-answer and structured questions. (15 marks)</p> <p><b>Section B</b> Short-answer and extended response questions based on related source material (35 marks)</p> <p><b>Total for Paper 1</b> <span style="float: right;"><b>50 marks</b></span></p>	<b>50%</b>

<b>Component</b>	<b>Weighting</b>
<p><b>Paper 2 Management in Context</b> <span style="float: right;"><b>1 hour 30 minutes</b></span></p> <p>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.</p> <p><b>Total for Paper 2</b> <span style="float: right;"><b>50 marks</b></span></p>	<b>50%</b>

## **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 influences 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.

## **Assessment objectives**

**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.

### MONTHLY COURSE DISTRIBUTION

Months	Contents
<b>August</b>	<b>Chapter 4 Water and its management</b> <ul style="list-style-type: none"> <li>➤ Unit 4.1 water distribution and its cycle</li> <li>➤ Unit 4.2 Water availability</li> </ul>
<b>September</b>	<b>Chapter 4 (Continued)</b> <ul style="list-style-type: none"> <li>➤ Unit 4.3 Water related diseases</li> <li>➤ Unit 4.4 Sources, impacts and managing water pollution</li> </ul>
<b>October</b>	<b>Chapter 5 Ocean and Fisheries</b> <ul style="list-style-type: none"> <li>➤ Unit 5.1 The resource potential of ocean.</li> <li>➤ Unit 5.2 World fisheries</li> </ul>
<b>November</b>	<b>Chapter 5 (Continued)</b> <ul style="list-style-type: none"> <li>➤ Unit 5.3 Exploitation of the ocean</li> <li>➤ Unit 5.4 Strategies of managing the harvesting of marine species</li> </ul>
	<b>Revision for Mid-Year Examination</b>
<b>Decemeber</b>	<b>MIDYEAR EXAMINATION</b>
<b>January</b>	<b>Chapter 6 Managing Natural Hazard</b> <ul style="list-style-type: none"> <li>➤ Unit 6.1 Tectonic hazards</li> <li>➤ Unit 6.2 Climatic hazards</li> </ul>
<b>February</b>	<b>Chapter 7 The Atmosphere and Human Activities</b> <ul style="list-style-type: none"> <li>➤ Unit 7.1 The atmosphere</li> <li>➤ Unit 7.2 Atmospheric pollution and its causes</li> </ul>
<b>March</b>	<b>Chapter 7 (Continued)</b> <ul style="list-style-type: none"> <li>➤ Unit 7.3 Impact of atmospheric pollution</li> <li>➤ Unit 7.4 Managing atmospheric pollution</li> </ul>
	<b>Revision for Final Examination</b>
<b>April</b>	<b>FINAL EXAMINATION</b>

## SYLLABUS CONTENT

<b>Chapter 4: Water and its Management</b>	
4.1 Global water distribution	<ul style="list-style-type: none"> <li>• Describe the distribution of the Earth’s water with regard to:               <ul style="list-style-type: none"> <li>➤ oceans</li> <li>➤ fresh water:                   <ul style="list-style-type: none"> <li>○ ice sheets and glaciers</li> <li>○ ground water</li> <li>○ atmosphere</li> <li>○ lakes and rivers</li> </ul> </li> </ul> </li> </ul>
4.2 The water cycle	<p>Describe and interpret the water cycle in light of the following terms:</p> <ul style="list-style-type: none"> <li>➤ precipitation</li> <li>➤ surface runoff</li> <li>➤ interception</li> <li>➤ infiltration</li> <li>➤ through-flow</li> <li>➤ ground water flow</li> <li>➤ transpiration</li> <li>➤ evaporation</li> <li>➤ condensation</li> </ul>
4.3 Water supply	<ul style="list-style-type: none"> <li>• Describe the sources of fresh water used by people:               <ul style="list-style-type: none"> <li>➤ aquifers</li> <li>➤ wells</li> <li>➤ rivers</li> <li>➤ reservoirs</li> <li>➤ desalination plants</li> </ul> </li> </ul>
4.4 Water usage	<p>Describe the different ways in which fresh water can be used:</p> <ul style="list-style-type: none"> <li>➤ domestic</li> <li>➤ industrial</li> <li>➤ agricultural</li> </ul>
4.5 Water quality and availability	<ul style="list-style-type: none"> <li>• Compare the availability of safe drinking water (potable water) in different parts of the world.               <ul style="list-style-type: none"> <li>➤ between water-rich and waterpoor regions and the potential for water conflict</li> <li>➤ access to safe drinking water in urban and rural areas</li> </ul> </li> </ul>
4.6 Multipurpose dam projects	<ul style="list-style-type: none"> <li>• Describe and evaluate multipurpose dam projects.               <ul style="list-style-type: none"> <li>➤ choice of site</li> <li>➤ environmental, economic and social impacts</li> <li>➤ sustainability</li> </ul> </li> </ul>
4.7 Water pollution and its sources	<p>Describe the following sources of water pollution:</p>

	<ul style="list-style-type: none"> <li>➤ domestic waste, including sewage from urban and rural settlements</li> <li>➤ industrial processes</li> <li>➤ agricultural practices</li> </ul>
4.8 Impact of water pollution	<ul style="list-style-type: none"> <li>• Describe and explain the impact of pollution of fresh water on people and on the environment. <ul style="list-style-type: none"> <li>➤ global inequalities in sewage and water treatment</li> <li>➤ risk of infectious bacterial diseases, typhoid and cholera</li> <li>➤ accumulation of toxic substances from industrial processes in lakes and rivers</li> <li>➤ bioaccumulation of toxic substances in food chains</li> <li>➤ the effect of acid rain on organisms in rivers and lakes</li> <li>➤ nutrient enrichment leading to eutrophication</li> </ul> </li> </ul>
4.9 Managing pollution of fresh water	<ul style="list-style-type: none"> <li>• Describe and explain the following strategies for improving water quality: <ul style="list-style-type: none"> <li>➤ improved sanitation</li> <li>➤ treatment of sewage</li> <li>➤ pollution control and legislation</li> </ul> </li> </ul>
4.10 Managing water-related disease	<ul style="list-style-type: none"> <li>• Describe the life cycle of the malaria parasite.</li> <li>• Describe and evaluate strategies to control malaria: <ul style="list-style-type: none"> <li>➤ antimalarial drugs</li> <li>➤ vector control</li> <li>➤ eradication</li> </ul> </li> <li>• Describe strategies to control cholera <ul style="list-style-type: none"> <li>➤ safe drinking water (potable water) supply</li> <li>➤ boiling and chlorination</li> </ul> </li> </ul>
<p>Case study</p> <p>Study the impact of a named multipurpose dam scheme</p> <p>Study the causes, impact and management of pollution in a named body of water</p>	
<b>Chapter 5 Oceans and Fisheries</b>	
5.1 Oceans as a resource	<ul style="list-style-type: none"> <li>• Outline the resource potential of the oceans <ul style="list-style-type: none"> <li>➤ food, chemicals, building materials</li> <li>➤ wave / tidal energy</li> <li>➤ tourism</li> <li>➤ transport</li> <li>➤ potential for safe drinking water</li> </ul> </li> </ul>
5.2 World fisheries	<ul style="list-style-type: none"> <li>• Outline the distribution of major ocean currents <ul style="list-style-type: none"> <li>➤ identify the position of major cold and warm ocean currents (names are not required)</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>➤ shallow water of continental shelves</li> <li>➤ cold and warm ocean currents</li> <li>• Explain the distribution of major marine fish populations.</li> <li>• Describe the El Niño Southern Oscillation (ENSO) phenomenon and its effects on fisheries along the Pacific coast of South America</li> </ul>
5.3 Impact of exploitation of the oceans	<ul style="list-style-type: none"> <li>• Describe and explain the impact of exploitation of fisheries <ul style="list-style-type: none"> <li>➤ overfishing of marine species</li> <li>➤ effect on target and bycatch species</li> </ul> </li> <li>• Describe how farming of marine species reduces the exploitation of fisheries</li> </ul>
5.4 Management of the harvesting of marine species	<ul style="list-style-type: none"> <li>• Describe, explain and evaluate strategies for management of the harvesting of marine species. <ul style="list-style-type: none"> <li>➤ net types and mesh size</li> <li>➤ other species-specific methods: <ul style="list-style-type: none"> <li>○ pole and line</li> </ul> </li> <li>➤ quotas</li> <li>➤ closed seasons</li> <li>➤ protected areas and reserves</li> <li>➤ conservation laws</li> <li>➤ international agreements (implementation and monitoring)</li> </ul> </li> </ul>
<b>Chapter 6 Managing Natural Hazards</b>	
6.1 Earthquakes and volcanoes	<ul style="list-style-type: none"> <li>• Describe the structure of the Earth: <ul style="list-style-type: none"> <li>➤ crust</li> <li>➤ mantle</li> <li>➤ core</li> </ul> </li> <li>• Describe and explain the distribution and causes of earthquakes and volcanoes <ul style="list-style-type: none"> <li>➤ global pattern and structure of plates</li> <li>➤ plate movement: <ul style="list-style-type: none"> <li>○ constructive</li> <li>○ destructive</li> <li>○ conservative</li> </ul> </li> </ul> </li> <li>• Understand magnitude and the Richter Scale</li> </ul>
6.2 Tropical cyclones	<ul style="list-style-type: none"> <li>• Describe and explain the distribution and causes of tropical cyclones (storms, hurricanes and typhoons) between 5° and 20° north and south of the Equator, ocean surface temperature of at least 27 °C and ocean depth of at least 60 m.</li> </ul>
6.3 Flooding	<ul style="list-style-type: none"> <li>• Describe and explain the causes of flooding. <ul style="list-style-type: none"> <li>➤ heavy rainfall, prolonged rainfall, snowmelt</li> <li>➤ land relief</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>➤ saturated soil, compacted soil</li> <li>➤ deforestation, cultivation and urbanisation</li> <li>➤ storm surges, tsunamis</li> <li>➤ rise in sea level through climate change</li> </ul>
6.4 Drought	<ul style="list-style-type: none"> <li>• Describe and explain the causes of drought. <ul style="list-style-type: none"> <li>➤ lack of rain caused by prolonged high pressure</li> <li>➤ effect of El Niño Southern Oscillation (ENSO) and La Niña on ocean temperatures and evaporation</li> <li>➤ effect of climate change</li> </ul> </li> </ul>
6.5 The impacts of natural hazards	<ul style="list-style-type: none"> <li>• Describe and explain the impacts of natural hazards on people and the environment. <ul style="list-style-type: none"> <li>➤ flooding: loss of life, loss of livestock, loss of crops, damage to buildings and infrastructure, contamination of drinking water supplies, water-related disease, financial losses</li> <li>➤ drought: death of organisms, water sources dry up, decline in crop yields, starvation, increased soil erosion, desertification, decrease in air quality, increased risk of wildfires</li> </ul> </li> </ul>
6.6 Managing the impacts of natural hazards	<ul style="list-style-type: none"> <li>• Describe and evaluate the strategies for managing the impacts of natural hazards before, during and after an event. <ul style="list-style-type: none"> <li>➤ tectonic: monitoring and warning, land use zoning, structure of buildings, disaster preparation (plans, drills, emergency supplies and emergency rescue teams), evacuation, rebuilding of damaged areas, international aid</li> <li>➤ tropical cyclones: monitoring and warning, structure of buildings, disaster preparation (plans, drills, emergency supplies and emergency rescue teams), evacuation, emergency shelters, rebuilding of damaged areas, international aid</li> <li>➤ flooding: monitoring and warning, use of storm hydrographs (run-off, through-flow, ground water flow), shelters, rescue, rebuilding of damaged areas, flood management techniques</li> <li>➤ drought: monitoring, emergency water supplies, water conservation, increase water supply (dams and reservoirs, wells, use of aquifers, water transfer, desalination, rainwater harvesting), international aid</li> </ul> </li> </ul>
6.7 Opportunities presented by natural hazards	<ul style="list-style-type: none"> <li>• Describe and explain the opportunities presented by natural hazards to people. <ul style="list-style-type: none"> <li>➤ flooding: deposition of silt on farmland</li> <li>➤ volcanoes: fertile soils, extraction of minerals, geothermal energy resources</li> </ul> </li> </ul>

## Case studies

Compare and contrast the strategies for managing the impacts of tectonic events between a named ore economically developed country (MEDC) and a named less economically developed country (LEDC).

Study the strategies for managing the impacts of a tropical storm or flood or drought

## Chapter 7 The atmosphere and human activities

### 7.1 The atmosphere

- Describe the structure and composition of the atmosphere:
  - troposphere, stratosphere, mesosphere, thermosphere
  - nitrogen, oxygen, carbon dioxide, argon, water vapour
  - the ozone layer
- Describe the natural greenhouse effect.

### 7.2 Atmospheric pollution and its causes

- 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 chlorofluorocarbons (CFCs)
- enhanced greenhouse effect: greenhouse gases (carbon dioxide, water vapour and methane)

- Describe and explain the causes of atmospheric pollution, with reference to:
  - smog
  - acid rain
  - ozone layer depletion
  - enhanced greenhouse effect

### 7.3 Impact of atmospheric pollution

- smog: effects on human health
- acid rain: acidification of bodies of water, effects on fish 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

- Describe and explain the impact of atmospheric pollution.
  - smog
  - acid rain
  - ozone depletion
  - climate change

<p>cataracts, damage to vegetation</p> <ul style="list-style-type: none"> <li>• climate change: melting of ice sheets, glaciers and permafrost; rise of sea-level; flooding and loss of land; forced migration</li> </ul>	
<p>7.4 Managing atmospheric pollution</p>	<ul style="list-style-type: none"> <li>• Describe and explain the strategies used by individuals, governments and the international community to reduce the effects of atmospheric pollution. <ul style="list-style-type: none"> <li>➤ reduction of carbon footprint</li> <li>➤ reduced use of fossil fuels</li> <li>➤ energy efficiency</li> <li>➤ carbon capture and storage</li> <li>➤ transport policies</li> <li>➤ international agreement and policies</li> <li>➤ CFC replacement</li> <li>➤ catalytic converters</li> <li>➤ flue-gas desulfurisation</li> <li>➤ taxation</li> <li>➤ reforestation and afforestation</li> </ul> </li> </ul>
<p>Case study</p> <p>Study the causes, impact and management of a specific example of atmospheric pollution</p>	