

Diploma Programme Course Outline		
Name of the DP subject	Environmental Systems & Societies	
Level	YR1 Standard	
YEAR 1		
UNIT 1- Foundations of ESS	TOPIC/CONCEPT	ASSESSMENT COMPONENTS
1.1- Foundations of ESS	<ul style="list-style-type: none"> ● Explore the concept of ESS and what it means; ● The Development of the Environmental Movement; ● Environmental Disasters; ● Differentiate between Environmental Value Systems; ● Case Studies- EVS 	<p>Students' Research and Presentation on Environmental Disasters.</p> <p>PSOW: Construct a systems diagram of the Water Cycle.</p>
1.2- Systems and Models	<ul style="list-style-type: none"> ● Define Systems and explore the range of scales for systems; ● Describe the characteristics of systems; ● Identify and differentiate between the types of systems; ● Evaluate the use of models 	

1.3- Energy and Equilibria	<ul style="list-style-type: none"> ● Laws of Thermodynamics and Environmental Systems; ● The Nature of Equilibria and the Environment (steady-state, static, stable and unstable equilibrium); ● Positive and Negative Feedback; ● Tipping Points; ● Resilience and Diversity in Systems 	<p>Students' Presentation on the Laws of Thermodynamics; the Nature of Equilibria, Positive and Negative Feedback & Tipping Points.</p> <p>Formative Assessment (Test): Topics 1.1-1.3</p>
1.4- Sustainability	<ul style="list-style-type: none"> ● Define and use correctly the terms: sustainability, sustainable development, natural capital, natural income; ● Natural Capital (sustainability and unsustainability); ● Ecological Footprint; ● The Millennium Ecosystems Assessment; ● Environmental Impact Assessment 	<p>Evaluate the use of Environmental Impact Assessments with the use Case studies</p>
1.5- Humans and Pollution	<ul style="list-style-type: none"> ● Define and identify the types of pollution; ● Differentiate between primary vs. secondary pollution; persistent vs. biodegradable pollutants and acute vs. chronic effects of pollution; ● Differentiate between point-source and non-point source pollution; ● DDT (costs and benefits of the ban); ● Environmental Impacts of DDT; ● Pollution Management 	<p>PSOW: Construct a systems diagram to model the impact of a named pollutant in a named location</p>

UNIT 2 – Ecosystems & Ecology	TOPIC/CONCEPT	ASSESSMENT COMPONENTS
2.1 - Species & Population	<ul style="list-style-type: none"> ● Difference between species, habitat and niches ● Abiotic factors of the environment ● Population interactions among species (predation, herbivory, parasitism, mutualism, disease, competition) ● Population growth curves (S- curve and J – curve) ● Limiting factors and carrying capacity of a population 	<p>PSOW: Investigate the fundamental and the realized niche of barnacles using a computer simulation.</p>
2.2 - Communities & Ecosystems	<ul style="list-style-type: none"> ● Communities & ecosystems definition ● Photosynthesis & respiration processes using the systems approach ● Feeding relationships in an ecosystem ● Trophic levels, food chains and food webs ● Efficiency of energy transfer through an ecosystem ● Pyramids of numbers, biomass and productivity 	<ul style="list-style-type: none"> - Draw systems diagrams for photosynthesis & respiration - Worksheet on ecological pyramids
2.3 - Flow of energy and matter	<ul style="list-style-type: none"> ● Transfer & transformation of energy ● Primary and secondary productivity ● Maximum sustainable yields ● Nutrient cycles using systems approach ● The impact of human activities on energy flows and matters cycle 	<p>Formative assessment (test) : Topic 2.1 - 2.3</p>

2.4 - Biomes, zonation and succession	<ul style="list-style-type: none"> ● Tricellular model of atmospheric circulation ● Investigating different biomes ● The effects of climate change on biome distribution ● Spatial & temporal changes in communities ● Climax communities ● <i>r</i> - and <i>K</i> - strategist species ● Impact of human activities on succession 	Presentation: Research and present on 4 selected biomes
2.5 - Investigating Ecosystems	<ul style="list-style-type: none"> ● Identifying organisms in ecosystems ● Measuring abiotic components of the ecosystem ● Measuring biotic components of the ecosystem ● Methods for estimating the biomass of trophic levels ● Species richness and diversity ● Measuring changes in ecosystems 	PSOW: Use a quadrat to estimate the population of different species arounds SDHS
UNIT 3 - Biodiversity and Conservation	TOPIC/CONCEPT	ASSESSMENT COMPONENTS
3.1 - An introduction to biodiversity	<ul style="list-style-type: none"> ● What is biodiversity ● Richness and evenness of a species ● Habitat and genetic diversity ● Conservation of biodiversity 	

3.2 - Origins of biodiversity	<ul style="list-style-type: none"> ● How biodiversity arises from evolutionary processes ● The role of isolation in forming new species ● Plate tectonics ● Mass extinction events of history 	Role-play - Students will reenact the story of Darwin and natural selection
3.3 - Threats to Biodiversity	<ul style="list-style-type: none"> ● Amount of species on Earth ● Current rate of species loss ● Causes of species loss ● Threats to tropical biomes ● Determining conservation status ● Species that are extinct, critical, and back from the brink of extinction ● Threats to an area of biological significance 	Field trip: Investigate the impact of human activity on biodiversity in the Simpson Bay Lagoon.
3.4 - Conservation of biodiversity	<ul style="list-style-type: none"> ● Arguments for preserving biodiversity ● Conservation organisations ● International conventions on biodiversity ● In situ versus ex situ conservation ● Designing protected areas ● Evaluating the success of a protected area 	<ul style="list-style-type: none"> - Research and present on a chosen environmental NGO. - Develop an original environmental NGO - Research and present on protected areas found in the Caribbean (at least 6 others not including those found in St. Maarten) <p>Formative assessment: Topic 3 - 4</p>
UNIT 4- Water, Aquatic Food Production Systems and Societies	TOPIC/CONCEPT	ASSESSMENT COMPONENTS
4.1- Introduction to Water Systems	<ul style="list-style-type: none"> ● The Hydrological Cycle; ● Human Influences on the Hydrological Cycle <ul style="list-style-type: none"> ○ Impact of: <ul style="list-style-type: none"> ■ Agriculture on water Systems 	

	<ul style="list-style-type: none"> ■ Deforestation on water systems ■ Urbanization on water systems ● Ocean Circulation (salinity, temperature, density), The Great Ocean Conveyor Belt. 	
4.2- Access to Fresh Water	<ul style="list-style-type: none"> ● Access to Fresh Water; ● Changes in demand and supply of fresh water; ● Sustainable Management of Water Resources; ● Conflict Arising from Shared water Resources 	Quiz on Chapters 4.1 & 4.2
4.3- Aquatic Food Production Systems	<ul style="list-style-type: none"> ● Sustainability in relation to wild fisheries and food production systems; ● Exploring Sustainable Food productions Systems; ● Managing Fisheries (exploring strategies in various countries); ● Aquaculture; ● Contrasting Views (EVS) on Whaling (Inuit & Japan) & Seal Hunting (Inuit vs Canadian Commercial Seal Hunting) 	
4.4- Water Pollution	<ul style="list-style-type: none"> ● Water Pollution & the Impacts on the Environment ● Water Quality; ● Biochemical Oxygen Demand; ● Eutrophication: <ul style="list-style-type: none"> ○ Natural & Anthropogenic causes; ○ Effects of Eutrophication; ○ Case Studies ● Managing strategies of Eutrophication; 	PSOW: Use secondary data to compare and contrast the impact of water pollution in two named areas.

	<ul style="list-style-type: none"> ● Dead Zones and Red Tides; 	Formative assessment: Topic 3 - 4
UNIT 5 - Soil systems, Terrestrial Food Production Systems and Societies	TOPIC/CONCEPT	ASSESSMENT COMPONENTS
5.1 - Introduction to soil systems	<ul style="list-style-type: none"> ● Soil profiles ● Soil systems ● Processes which forms soil ● Structure and properties of soil 	<p>PSOW: Lab activity - To investigate the ecosystems of the soil around the school environment</p> <p>Construct a model of a soil profile</p>
5.2 - Terrestrial food production systems	<ul style="list-style-type: none"> ● Sustainability of terrestrial food production systems ● Inequalities in global food supply ● Food waste; The nature of waste ● Links between social systems and food production systems ● Availability of land for food production ● Efficiency of terrestrial food production systems ● Inputs, outputs, and environmental impacts of terrestrial food production systems ● Increasing sustainability of terrestrial food production 	Compare and contrast 2 named food production systems
5.3 - Soil degradation and conservation	<ul style="list-style-type: none"> ● Soil as an ecosystem ● Factors which reduces soil fertility ● Commercialized food production systems ● Results of reduced fertility ● Soil conservation methods 	

UNIT 7- Climate Change and Energy Production	TOPIC/CONCEPT	ASSESSMENT COMPONENTS
7.1- Energy Choices and security	<ul style="list-style-type: none"> ● Range of Energy Resources (Advantages and Disadvantages); ● Energy Security and the Potential for Conflict; ● Factors Affecting Energy Choices; ● Energy Conservation; ● Case Studies 	Students' Presentation on Energy Choices in selected countries
7.2- Climate Change Causes and Impacts	<ul style="list-style-type: none"> ● Differentiate between Climate and Weather; ● Ocean Circulatory Belt; ● Atmospheric Circulatory Systems; ● Greenhouse Gases and Human Activities; ● The Effects of Global Warming; ● Feedback and Global Warming; ● Arguments about Global Warming 	Students' Presentation on the Impacts of Climate Change in selected countries
7.3- Climate Change Mitigation and Adaptation	<ul style="list-style-type: none"> ● Mitigation Strategies; ● Adaptation Strategies; ● The Politics of Carbon Dioxide Mitigation and Adaptation; ● The Kyoto Protocol, Paris Agreement, The Intergovernmental Panel on Climate Change 	Students' Presentation on Mitigation and Adaptation Strategies used in selected countries

All Diploma Programme courses are designed as two-year learning experiences.