

**SEC EXAMINATION (2011)**

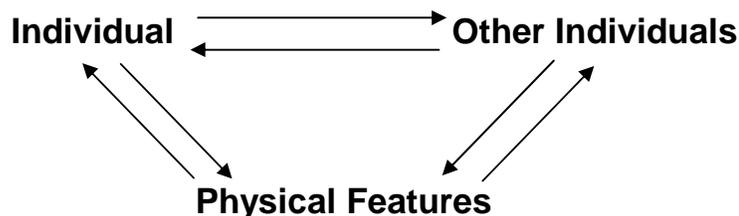
**ENVIRONMENTAL STUDIES**

**SEC 13**

**SYLLABUS**

### Introduction

In this syllabus the term "environment" is taken to mean the set of interrelationships linking an individual to other individuals and to the surrounding physical features. The success of an individual in his/her environment is determined by the level of harmony between these interrelationships.



This definition implies that teachers should treat this subject in a holistic manner and not present their students with a list of unrelated facts. Teachers are requested to link together all the environmental aspects to be referred to later, so that a clear idea is given of the interactions that exist between all the factors that form the environment.

The best way of treating this subject is through an interdisciplinary approach in which teachers of various subjects give their share with the result that a complete picture of the different aspects found in the Maltese environment is given. To make this possible, the "time-table" should be structured in a way that facilitates this flexibility.

Although it is expected that candidates become more aware of all that is Maltese, the syllabus seeks to present all this within a wider dimension, that is within a Mediterranean context. However, one should remember that in order to be effective, candidates should be more conscious of the immediate environment that surrounds them. Hence it is suggested that, wherever possible, the environmental aspects mentioned in the syllabus be related to the home, community, village or town of the candidates taking this subject.

Finally, all forms of environment education should lead candidates to participate actively in the protection and care of the environment. This is the aim of the project referred to later on in this syllabus. Hence it is suggested that the methodology used should be one that will offer direct experience of the environment, by means of fieldwork, discussions and the exchange of opinions in the classroom.

### Aims

The principal aim of this syllabus is to instil and nurture in the candidates the necessary knowledge, skills, attitudes and values so that as citizens they would take care of, embellish and utilise the environment with a sense of responsibility towards the present and future generations. Hence this syllabus helps the candidates:

- (a) to acquire the information, values, attitudes and practical skills necessary to help them become capable of foreseeing and solving environmental problems by participating more actively and in a responsible and effective way in the care of the environment;
- (b) to observe the biophysical, sociocultural and economic aspects of the natural and the human environment and hence be able to understand and interpret the complexities of the interactions between them;
- (c) to develop a sense of responsibility and solidarity by understanding how personal and local actions could have national, regional as well as global repercussions.

### Examination Objectives

Candidates are expected to:

- (a) acquire the necessary information to enable them to understand environmental problems, particularly local ones;
- (b) apply knowledge of ecological concepts and acquired skills to analyse environmental issues;
- (c) apply acquired knowledge to foresee consequences of actions and suggest alternative proposals for the protection of the environment;
- (d) see from where they can obtain further information about the environment, so that they could form a holistic perspective of environmental issues;
- (e) understand and communicate how religious, economic, political and social aspects of Maltese culture influence the environment;
- (f) understand and communicate the environmental impact of individual actions;
- (g) identify a variety of environmental issues of a local, national, regional, or global nature and their ecological and cultural implications;
- (h) suggest alternative and practical solutions to environmental issues and see the ecological and cultural implications of these suggestions;
- (i) understand the necessity of serious analysis of environmental issues before decisions are taken about them;
- (j) understand how diverse opinions and values affect environmental issues and the necessity of clarifying personal values before decisions about the environment are taken;
- (k) understand the necessity of responsible action by citizens to find solutions for environmental problems;
- (l) analyse environmental issues as well as the values/opinions related to them in an ecological and cultural context and be able to identify practical solutions for them;
- (m) show that they are able to examine, clarify and also change values and opinions in the light of new information;
- (n) examine what actions they should take as citizens to solve environmental issues in the light of **their** ecological and cultural implications;
- (o) choose/select the best action they could take as citizens so as to solve any particular problem; and
- (p) indicate that they are competent in the variety of actions they may have to take for the benefit of the environment.

## Scheme of the Examination

The paper will be set in two versions: Maltese and English. Candidates may answer any question in Maltese and/or English, however no change of language is permitted within the same answer.

**Paper I** (45% of the global mark) is compulsory for all candidates. Questions in this paper will reflect all of the six themes included in the syllabus. Candidates have to answer **ALL** questions. **The paper will be divided into two sections:**

**Section A** (Total marks: 40) will include from 9 to 15 short answer questions that will reflect all of the six themes of the syllabus.

**Section B** (Total marks: 50) will include two questions based on sources. Candidates are advised to spend 50 minutes on Section A and 1 hour 10 minutes on Section B.

**Paper II** (40% of the global mark) There will be two versions of this paper: Paper IIA and Paper IIB. Candidates will have to indicate which version they intend to sit for on their registration form. No alteration in the selection of this paper will be allowed after the end of the closing date for registration.

Both papers will be divided into three sections:

*Section A* will include two questions: one on theme 1 and one on theme 2

*Section B* will include two questions: one on theme 3 and one on theme 4

*Section C* will include two questions: one on theme 5 and one on theme 6

Candidates will have to answer **four** questions, with at least one question from each section.

*Paper IIA* will be more difficult than Paper I. Questions in this paper will require answers of an argumentative and analytical nature, and will test the candidates' ability to solve problems related to every aspect of the environment. Each question shall carry 20 marks:  $4 \times 20 = 80$  marks.

*Paper IIB* will consist of relatively easier questions than those of Paper I. The questions will be structured and will require short answers. They will be of a descriptive or factual (not argumentative or analytical) nature. No questions requiring an essay type answer will be set. Each question shall carry 20 marks:  $4 \times 20 = 80$  marks.

**Project** (15% of the global mark)

This practical component shall be assessed by the schools during the candidates' course of study. Projects are to be available at the candidates' schools for moderation by the Markers' Panel. The school assessments should reach the MATSEC Examinations Board as directed by the Matsec Support Unit. Private candidates are required to submit their projects to the MATSEC Examinations Board for assessment by the Markers' Panel as indicated by the Matsec Support Unit. Candidates may be called for an interview relating to their projects.

### Notes for Moderation of the Project

The project is chosen, by the candidates themselves, from any **one** of the following topics:

- **Topic 1: The geographical and geological context of a historical or archaeological site in Malta or Gozo.**
- **Topic 2: Man's impact on one of the valleys of the Maltese islands.**
- **Topic 3: The main characteristics of the Maltese village core.**
- **Topic 4: An example of civil architecture of the British period.**
- **Topic 5: Investigating one primary activity in Malta – Does it still have a future?**
- **Topic 6: How green are the new cars on the market and do young people consider environmental aspects when buying their first car?**

The project should consist of a report of approximately 1500 to 2000 words about the chosen topic. In their write up candidates are expected to develop the topic in their own words and to supplement their account with appropriate statistics, graphs and photos/sketches/diagrams (with appropriate captions). While candidates are encouraged to use the available literature and the Internet for their research, they are reminded that plagiarised work will be heavily penalised.

This work shall carry a total mark of 30/200 or 15% of the global mark of the examination. When moderating the project the Markers' Panel will take the following points into consideration:

- (a) Planning and the candidates' initiative to work on their own;
- (b) Development of the work indicating the candidates' ability to face situations and people so as to be able to make observations and collect and assess information;
- (c) Effort to ensure that the report is the result of personal work, observations and ideas;
- (d) Ability to make use of information, surveys and statistics;
- (e) Conclusion indicating ideas, observations and suggestions which the candidates make as a result of all that they observe and judge.

### **Results**

Candidates who opt for Paper I and Paper IIA may obtain Grades from 1 to 5 (i.e. Grades 1, 2, 3, 4, 5). Those reaching a level less than Grade 5 shall remain Unclassified (U).

Candidates who opt for Paper I and Paper IIB may obtain grades not higher than 4 (i.e. Grades 4, 5, 6, 7). Those having a grade less than 7 will remain Unclassified (U).

## Grade Descriptions

Grade descriptions are a general indication of the standard of achievement shown by candidates awarded particular grades. The grade awarded will depend upon the extent to which the candidate has met the 'Assessment Objectives' over-all.

	<b>Grade 1</b>	<b>Grade 5</b>	<b>Grade 7</b>
	Candidates achieving Grade 1 are expected to demonstrate sufficient knowledge and understanding to make judgements on local environmental issues.	Candidates achieving Grade 5 are expected to demonstrate sufficient knowledge and understanding of a range of local environmental issues.	Candidates achieving Grade 7 are likely to be familiar with simple facts to be able to understand straightforward local environmental issues.
	More specifically, candidates are able to demonstrate the ability to:	More specifically, candidates are able to demonstrate the ability to:	More specifically, candidates are able to demonstrate the ability to:

<b>1</b>	recall a wide range of facts and principles in the subject content from all areas of the syllabus.	recall a good range of facts and principles in the subject content.	recall the basic facts and principles in the subject content
<b>2</b>	recall how a wide range of simple religious, economic, political and social aspects of Maltese culture influence the environment and explain the principles underlying them.	recall simple religious, economic, political and social aspects of Maltese culture that influence the environment and explain the principles underlying them.	recall simple religious, economic, political and social aspects of Maltese culture that influence the environment
<b>3</b>	use knowledge of social, ecological and cultural processes and principles in familiar situations, apply it to unfamiliar situations and formulate hypotheses.	use knowledge of social, ecological and cultural processes and principles in familiar situations and apply it to unfamiliar situations.	use knowledge of social, ecological and cultural processes and principles in familiar situations.
<b>4</b>	describe a variety of local, national, regional, or global environmental issues and their ecological and cultural implications and suggest alternative and practical solutions.	describe a variety of local, national, regional, or global environmental issues and their ecological and cultural implications.	describe a variety of local, national, regional, or global environmental issues.
<b>5</b>	describe links between related environmental phenomena.	describe links between simple related environmental phenomena.	understand the links between simple related environmental phenomena.
<b>6</b>	suggest various actions they could take to resolve environmental issues and select the best action they could take in the light of its ecological and cultural impact.	suggest various actions they could take to resolve environmental issues based on their ecological and cultural impact.	suggest various actions they could take to resolve environmental issues.

## Syllabus

### Theme 1: The World – our home

#### Weather and climate

The difference between weather and climate. Factors affecting climate of a place: latitude, distance from the sea, prevailing winds and altitude. Processes that lead to rainfall: relief, convectional and frontal rainfall. Weather conditions associated with mid-latitude cyclones (depressions) and anti-cyclones. Reading weather maps (synoptic charts). Main climatic characteristics of these major world regions: Mediterranean, Equatorial Rainforests, and Hot Deserts. Global climate change: global warming/greenhouse effect (CO<sub>2</sub>, deforestation, methane, CFCs). Depletion of the ozone layer: main causes and consequences. Role of young people in dealing with the above environmental issues.

#### Rocks and how they were formed

The three families of rock namely igneous, sedimentary and metamorphic. The formation and main characteristics of the sedimentary rocks of the Maltese Islands. Use of various types of rocks found in the Maltese Islands. Fossils form part of our national heritage. Weathering of rocks: frost shattering, onion-skin weathering or exfoliation, biological and chemical weathering.

Soil as a vital natural resource. Factors leading to soil formation. The 4 main components of soil: texture, depth, colour, organic content. A simple soil profile. Types of soil in the Maltese Islands (Terra Rossa Soils, Xerorendzina Soils and Carbonate Raw Soils). Soil erosion: natural causes (rain and wind) and human causes (deforestation, up and down ploughing, overgrazing, soil exhaustion, collapsed rubble walls and extension of building sites). Soil conservation and management (afforestation, contour ploughing, crop rotation, controlled grazing, terraced fields).

#### Tectonic Activity

The Mediterranean region as a seismic region. Location of sites within the Mediterranean prone to earthquakes and volcanic activity (Greece, Italy, Turkey). The structure of the earth (core, mantle, crust). Plate Tectonics: the causes of earthquakes and volcanoes. Dangers associated with earthquakes. Volcanic activity: active, dormant and extinct volcanoes. The hazards (loss of life, damage to property and natural environments) and benefits (fertile soils, formation of precious stones, geothermal energy and tourist attractions) of volcanoes.

#### The Sea

Wave action (erosion, transportation and deposition) and resultant coastal features (wave cut notches, wave-cut platforms, cliff retreat, formation of headlands and bays, headland erosion (caves, arches, stacks, stumps). Examples of these coastal landforms from the Maltese Islands.

#### Rivers

Features of a river basin (gorges, waterfalls, flood plains, meanders and alluvial soils). Causes of flooding (flat land, heavy rainfall, deforestation, clearing of farmland for buildings and streets, Climate Change). Flood control: benefits and problems.

#### The Ecosystem

The ecosystem as a system of interrelationships among living things, and between living things and the physical features around them. The role of plants as producers. The role of animals as consumers. The role played by certain organisms in the recycling of nutrients. Examining the inter-relationships of the living species (biotic) and non-living (abiotic) aspects within the valley ecosystem. The threats harming the natural ecosystems of our valleys: area taken over by alien plants, re-routing of excessive run-off waters, noise pollution by visitors, dumping of waste, construction of houses or places of entertainment.

#### Human society

Socialisation process: norms and values as means of social cohesion. The role of values in the process of societal development. Education in national citizenship. Towards an education for global citizenship. Particular examples of such good practice in schools: Ekoskola, Global Education Week, Global Action Schools, Connectando Mundos, Young Reporters for the Environment. Malta's contribution to the peace process in Europe and the Mediterranean region since Independence.

## Theme 2: Management of Resources

### Sustainable Development

Sustainable development defined as development that respects the environmental, societal and economic needs of a country. The measures required to ensure the sustainability of the construction industry within the Maltese Islands (legislation, MEPA operations, Environmental Impact Assessments, public awareness campaigns, the role of NGOs). The adoption of a more sustainable lifestyle by the young people of Malta.

### Malta's strategic importance throughout the ages

The importance of the Grand Harbour (ria harbour) over the span of time. A general outline of Malta's use (by several powers) before 1530. The maritime importance of Malta during the Knights' Period. Malta's role as a naval base and its contribution in the Crimean War and the two World Wars. The effects of the opening of the Suez Canal and Malta's role as a services centre in the Mediterranean. The role of the Freeport today.

### Agriculture

Types of farming (arable, pastoral and mixed). Use and effects of crop-rotation, irrigation, fertilisers, chemical and biological pest control, rubble walls. Definition and advantages of organic-farming.

### Water

The hydrological cycle. Water supply: runoff, catchment areas, water table/aquifers, reverse osmosis and sewage treatment. Threats to the water table/aquifer: less rainfall; over extraction; pollution; infiltration of chemicals and sea water.

### Non-renewable resources

Types of limestone quarrying in Malta (soft and hard stone). The impact of quarrying on the Maltese environment. Sustainable quarrying. Restoring unused quarries: dumping of construction waste, creating tourist attractions.

Non-renewable energy resources: oil, gas, coal (fossil fuels) and their effect on the environment. Malta's carbon emissions in comparison with other EU Mediterranean countries: reference to National Statistics Office (NSO) statistics. The use and advantages of alternative sources of energy (wind, solar, wave, hydroelectric power, geothermal, tidal).

### The Sea

Impact on the sea environment by human activity: dumping of untreated sewage, oil spills, industrial wastes, sewage plants, fish farming, creation of new sandy beaches. Effects of sea pollution. The impact of fish farming on the marine environment and the tourist industry.

### Biodiversity

Loss of biodiversity caused by: habitat destruction, unsustainable hunting/fishing practices and the importation of alien plant and animal species. Case study of the biodiversity of a named valley in the Maltese Islands. Protection and conservation of endangered flora, fauna and their habitats. The role of national reserves to provide sanctuary for endangered species, protect specific habitats and to help citizens appreciate the natural environment. Focus on a named protected site in the Maltese Islands.

### Waste Management

The three Rs of waste management: reduce, reuse and recycle and their hierarchy. Waste as a resource. Engineered landfilling and incineration. Possible solutions to the litter problem in Malta.

### Human resources

Lifelong education for human resource development. The Maltese education system and human resource development in Malta. Human resource management and its implications for social action (institutions, social services, work).

### **Theme 3: Human population**

Factors that determined a good quality of life and their development through the ages:

#### **Population**

The increase in population. Distribution of population and density (positive and negative factors). Migration (push and pull factors). The impact of housing on the environment.

#### **Settlement patterns**

Historic and demographic development of Maltese towns and villages. Inner cities and the development of various suburbs with special reference to Rabat (Malta and Gozo); Floriana the Three Cities and Sliema.

The historical importance of the old cities: Mdina, Birgu, Valletta and Victoria. Lost Maltese villages. The modern towns and extensions of the Maltese villages with particular reference to residential areas, summer residential areas and tourism centres. Contrast with old settlement patterns.

#### **Housing**

The Mandraggio as a case study of the housing problem and the bad sanitary conditions in the old cities during the last two centuries. Health problems caused by a contaminated water supply and inadequate sewage systems. The effects of war and reconstruction. The building of 'housing estates' in various localities. The problem of vacant houses.

#### **Public health**

Hospitals and health care through the ages. Infectious diseases (plague and cholera) and their impact on the population. The discovery of the microbe causing Undulant Fever in goat's milk by Sir Temi Zammit.

#### **Education**

Important milestones in education from 1800 onwards: The Royal Commission of 1836 and the Keenan Report. The language question and its influence on education. The Compulsory Education Acts.

#### **Transport**

Roads, sea and air transport. Factors influencing choice of transport type (distance, time, cost and content). Development of different modes of transport (i.e., carts, omnibus, train, tram, ferries, buses) related to the expansion of communication networks. The influence of transport on people's lives (mobility, inequality of access, reduced spaces for recreation, different forms of pollution, accidents).

### **Theme 4: Human communities**

#### **The local community**

People within the community (children, youth, elderly, persons with different needs).

Institutions within the community: religious, educational, health, political, legal and leisure. Socio-cultural-religious organisations. Evaluation of the social relationships between these institutions/organisations and the individual.

#### **Maltese Cultural Heritage**

Elements making up a people's cultural identity (i.e., language, norms and values, technological development). Culture as a people's way of life.

Norms as a means of social cohesion in the Maltese society. Customs related to the way the Maltese celebrate religious and non-religious feast days, family celebrations, sports events. The role of values (respect, equality of opportunity, rights, responsibilities, accepting of differences) in the development of society.

#### **The architectural heritage of the Mediterranean region**

The pyramids of Egypt, the Acropolis of Athens, the Greek temples in Agrigento (Sicily), the Coliseum (Italy), classical remains in Sabratha (Libya) and Carthage (Tunisia), and Moorish architecture in Alhambra (Spain).

#### **Maltese architectural heritage**

**General reference to Prehistoric, Punic, Roman, Palaeo-Christian and Medieval remains (temples, tombs, defensive walls, houses, baths, towers and catacombs).**

### **Vernacular architecture**

The main characteristics of a typical Maltese village. Typical Maltese countryside buildings and their function: rubble walls, 'giren', 'ghorof', 'duri', 'mqajel' and 'rziezet'. General reference to niches and chapels in Malta and Gozo. Troglodyte structures.

### **The Knights Period**

The **mannerist and baroque** architectural heritage of the Knights of St John (auberges, palaces, houses and churches). The Conventual Church of St. John (Valletta). Hospitals and other buildings related to the Knights. **The Wignacourt Aqueduct**. Fortifications and defence during the Order's stay: the building of walls, bastions, fortresses and towers. The defence of the Grand Harbour and Marsamxett. The coastal defences. Fortifications in Gozo.

### **The British period**

The strengthening of the defences left by the Order (St. Elmo, St Angelo, Cottonera). The building of new fortifications. The importance of defensive lines and coastal batteries. **The neo-classic and neo-gothic architecture**.

### **Modern buildings**

**Modern constructions and how they reflect the social change that Maltese society went through since World War II.**

### **Conservation and restoration**

The need for conservation and restoration of the Maltese architectural heritage. The role of government agencies (Heritage Malta). The role of local councils and voluntary organisations.

## **Theme 5: Work and Leisure**

### **The **four** sectors of the economy**

The development of the Maltese economy: from a fortress economy to a varied economy. The four economic sectors: primary (agriculture, fishing, quarrying), secondary (manufacture), tertiary (services) **and the quaternary (digital) sector**. Examples of these **four** sectors from the Maltese economy.

Manufacturing industries (Inner City location): siting of factories. Industrial Estates. The impact of industry on the environment. Exports and imports. Gross Domestic Product (GDP). **Socio-economic development. Malta's economic relations with other countries.**

Tourism in Malta: benefits and its implications for economic and social life in Malta. Eco-tourism. A global perspective of tourism. Negative impacts of tourism on the environment.

### **Social implications of work**

The social partners, workers' unions, workers' participation, workers' co-operatives, occupational health and safety.

Human resource management and work effectiveness. How developments in the work environment has influenced society and people's life styles (development of new shopping centres, inequality of access, need of new skills).

### **The Maltese life style**

The influence of the media, emigration and tourism on the Maltese life style. Irregular immigration in Malta and its effect on the country. The development of a multicultural society. Comparison between the complexity of the present life style and the simplicity of the former life style.

Leisure in Malta in the 19<sup>th</sup> century. Leisure activities: village festas, horse racing, 'l-Imnarja', agricultural fairs, Carnival, band clubs, wine shops and folk singing. Comparison between past and present forms of leisure activities.

## **Theme 6: Managing a nation**

### **Politics**

Politics as a process of participation in civic life. Political parties and democratic way of life for citizens.

Politics as a system based on pressure groups, political parties, parliamentary system. The role of political parties in society's development.

The role of local councils in local community development. Interactions between the central government and local governments.

### **Constitutional development in Malta**

The Sette Guigno and the granting of the Self Government constitution of 1921. The 1947 constitution and the introduction of universal suffrage. The granting of independence. Malta becomes a Republic.

### **Malta in the European Union**

The origins of the European Union (EU). Institutions of the EU: European Parliament, the European Commissioner; the Council of Ministers. A cursory look at Malta's political and economic development in the EU.