



# **Geography General Course Year 12**

## **Selected Unit 3 syllabus content for the**

### **Externally set task 2021**

This document is an extract from the *Geography General Course Year 12 syllabus*, featuring all of the content for Unit 3. The content that has been highlighted in the document is the content on which the Externally set task (EST) for 2021 will be based.

All students enrolled in the course are required to complete an EST. The EST is an assessment task which is set by the Authority and distributed to schools for administering to students. The EST will be administered in schools during Term 2, 2021 under standard test conditions. The EST will take 50 minutes.

The EST will be marked by teachers in each school using a marking key provided by the Authority. The EST is included in the assessment table in the syllabus as a separate assessment type with a weighting of 15% for the pair of units.

# Unit 3 – Natural and ecological hazards

## Unit description

Natural and ecological hazards represent potential sources of harm to human life, health, income and property, and may affect elements of the biophysical, managed and constructed elements of environments.

This unit focuses on understanding how these hazards and their associated risks are perceived and managed at local, regional and global levels. Risk management, in this particular context, refers to prevention, mitigation and preparedness. Prevention is concerned with the long term aspects of hazards and focuses on avoiding the risks associated with their reoccurrence. Mitigation is about reducing or eliminating the impact if the hazard does happen. Preparedness refers to actions carried out prior to the advance notice of a hazard to create and maintain the capacity of communities to respond to, and recover from, natural disasters. Preparedness starts at the local community level but may branch out to national and international levels through measures, such as planning, community education, information management, communications and warning systems.

Building on their existing geographical knowledge and understandings, students explore natural hazards, including atmospheric, hydrological and geomorphic hazards; for example, storms, cyclones, tornadoes, frosts, droughts, bushfires, flooding, earthquakes, volcanoes and landslides. They will also explore ecological hazards; for example, environmental diseases/pandemics (toxin-based respiratory ailments, infectious diseases, animal-transmitted diseases and water-borne diseases) and plant and animal invasions.

Students develop an understanding about using and applying geographical inquiry tools, such as spatial technologies, and skills, to model, assess and forecast risk, and to investigate the risks associated with natural and ecological hazards. The potential for fieldwork depends on the hazard selected, such as a visit to the town of Meckering to study earthquakes or the impact of a specific cyclone, flood or bushfire on a town or region.

## Learning outcomes

By the end of this unit, students:

- understand the nature and causes of natural and ecological hazards
- understand the nature of the risks to be managed, such as loss of property/life, effects on infrastructure, jobs, economy, and physical and mental health
- understand that places and environments are influenced by both natural and ecological hazards
- understand the complexity of human-environment interdependence in relation to natural and ecological hazards
- demonstrate a knowledge of the concept of risk management
- understand and apply key geographical concepts, including place, space, environment, interconnection, sustainability, scale and change, as part of a geographical inquiry
- apply geographical inquiry skills and a range of other geographical skills, including spatial technologies and fieldwork, to investigate natural and ecological hazards.

## Unit content

This unit includes the knowledge, understandings and skills described below.

### Geographical Knowledge and Understanding

#### Overview of natural and ecological hazards

- an overview of the nature of natural and ecological hazards with particular reference to:
  - the concept of hazard geography
  - identification and classification of natural hazards (atmospheric, hydrological and geomorphic)
  - examples of natural hazards, including storms, cyclones, hurricanes, typhoons, tornadoes, frosts, droughts, bushfires, flooding, earthquakes, volcanoes, landslides
  - ecological hazards, including environmental diseases/pandemics (toxin-based respiratory ailments, infectious diseases, animal-transmitted diseases and water-borne diseases), and plant and animal invasions
- the concepts of risk and hazard management as applied to natural and ecological hazards
- the spatial and temporal distribution, magnitude, duration, frequency, probability and scale of spatial impact of natural and ecological hazards at a global scale
- the role of spatial technologies in the study of natural and ecological hazards

Students complete **two** depth studies which are taught with the requisite geographical inquiry skills and additional geographical skills described as part of this unit.

#### Depth study one

Using fieldwork and/or secondary sources, students investigate **one** natural hazard and the means by which the risks associated with the hazard are being managed. The scale of study is determined by the nature of the natural hazard selected.

Students study the hazard in order to investigate:

- the nature and causes of the hazard
- the nature of the risks to be managed such as:
  - loss of property/life
  - effects on infrastructure, jobs and the economy
  - the impact on physical and mental health
- the space and time distribution of the hazard and how an understanding of biophysical and human processes can be used to explain the patterns that are identified
- the magnitude, duration, frequency, probability and scale of spatial impact of the hazard
- the physical and human factors that explain why some places and people are more vulnerable to the hazard than others

- the means by which the activities of people can intensify the impacts of the hazard, such as:
  - land clearance and its impact on the intensity and frequency of flooding
  - removal of coastal dune barrier systems
  - building of settlements on low lying coastlines threatened by tsunamis
  - using construction techniques unable to withstand seismic activity
- the environmental, economic and social impacts of the hazard in a developed country, such as Australia compared with at least one less developed country or region.

## Depth study two

Using fieldwork and/or secondary sources, students investigate **one** ecological hazard and the means by which the risks associated with the hazard are being managed. The scale of study is determined by the nature of the ecological hazard selected.

Students study the hazard in order to investigate:

- **the nature and causes of the hazard**
  - the nature of the risks to be managed such as:
    - loss of property/life
    - effects on infrastructure, jobs and the economy
    - the impact on physical and mental health
  - the space and time distribution of the hazard, and how an understanding of biophysical and human processes can be used to explain the patterns that are identified
  - the magnitude, duration, frequency, probability and scale of spatial impact of the hazard
- **the physical and human factors that explain why some places and people are more vulnerable to the hazard than others**
  - the means by which the activities of people can intensify the impacts of the hazard such as:
    - deliberate or accidental introduction of foreign plant or animal species to natural ecosystems
    - global transport systems, human settlement and agriculture facilitating the spread of infectious diseases
  - the environmental, economic and social impacts of the hazard in a developed country, such as Australia compared with at least one less developed country or region

## Geographical Inquiry and Skills

All the following skills should be taught during the unit. Relevant skills will be emphasised for each depth study.

### Geographical inquiry skills

#### Observing, questioning and planning

- formulate geographical inquiry questions
- plan a geographical inquiry with clearly defined aims and appropriate methodology

### **Collecting, recording, evaluating and representing**

- collect geographical information incorporating ethical protocols from a range of primary (interviews, questionnaires, student's own experiences, and field observations) and secondary sources (online maps, websites, spatial software applications, print resources and visual media)
- record observations in a range of graphic representations using spatial technologies and information and communication technologies
- evaluate the reliability, validity and usefulness of geographical sources and information
- acknowledge sources of information and use an approved referencing technique

### **Interpreting, analysing and concluding**

- analyse geographical information and data from a range of primary and secondary sources and a variety of perspectives to draw reasoned conclusions and make generalisations
- identify and analyse relationships, spatial patterns and trends and makes predictions and inferences

### **Communicating**

- communicate geographical information, ideas, issues and arguments using appropriate written and/or oral, cartographic, multimodal and graphic forms
- use geographical language in appropriate contexts to demonstrate geographical knowledge and understanding

### **Reflecting and responding**

- apply generalisations to evaluate alternative responses to geographical issues at a variety of scales
- propose individual and collective action, taking into account environmental, social and economic factors and predict the outcomes of the proposed action

### **Geographical skills**

#### **Mapping skills** (use of maps and atlases)

- identify and interpret a variety of topographic maps, thematic maps (physical, political, and social maps, overlay maps, synoptic charts and climate maps) and statistical maps (proportional circle and dot distribution maps) at different scales (local, national and global)
- understand and interpret marginal information represented on maps (title, conventional signs contained in the legend, north point, numerical and linear scales)
- establish position on a map using alphanumeric grid coordinates, eastings and northings, four figure area references, six figure grid references, and latitude and longitude expressed in degrees and minutes
- establish direction on a map using general compass directions (8 points) and bearings
- interpret and express scale in written, linear and ratio (representative fraction) formats, and convert scale from one format to another
- apply the map scale to basic calculations to determine distance and area
- interpret relief on a map using contours and spot heights to describe the steepness and shape of a slope (concave, convex and uniform)

- identify different relief features (landforms, including hills, valleys, plains, spurs, ridges, escarpments, saddles, cliffs) and different types of natural vegetation cover and hydrological features
- construct simple annotated sketch maps using map conventions (border, title, legend, north point and approximate scale)
- identify and interpret natural features and cultural features on a map
- describe the site and situation of places
- **identify and describe spatial patterns**, including land use, settlement and transport
- identify and describe spatial relationships between natural and cultural features

**Remote sensing skills** (use of remote sensing products, such as ground level photographs, aerial photographs, radar imagery and satellite imagery)

- identify and describe natural and cultural features and their patterns on the Earth's surface using ground level photographs, aerial photographs (vertical and oblique), radar imagery and satellite imagery (Landsat, weather satellites and Google Earth)
- compare the different types of information available from remote sensing products with the information depicted on a topographic map
- use remote sensing products as an aid to interpreting natural and cultural features shown on topographic maps
- determine direction on remote sensing products
- apply scale to the calculation of distance on remote sensing products
- interpret the difference in scale between a photograph and a topographic map of the same place

**Geographical and statistical data skills** (use of geographical and statistical data in formats, such as maps, tables, graphs and diagrams)

- calculate and interpret descriptive statistics, including central tendency (arithmetic mean, median, mode) and variation (maximum, minimum and range)
- interpret and apply data from different types of statistical maps (isopleth/isoline, choropleth, proportional circle and dot distribution maps)
- **interpret and construct tables and graphs, including: picture graphs; line and bar graphs; scattergrams; climatic graphs; pie graphs; flowcharts and population pyramids**
- use simple systems and flow diagrams to organise thinking about relationships
- extrapolate trends over time to forecast future conditions

**Skills in the use of information and communications technology and geographical information systems** (in a geographic context)

- use the internet as a tool for geographical research
- use simple applications, software and online resources (including Google Earth and Google Maps) to access atlases and remote sensing products (photographs, radar imagery and satellite imagery) for the purpose of identifying and describing spatial patterns and relationships

- access common databases, such as the Bureau of Meteorology, for spatial and statistical information
- use geospatial technologies, including global positioning systems (GPS), to collect and map spatial data
- use simple geographical information systems (GIS) products in description and analysis relevant to the unit content

**Fieldwork skills** (use of field observations and measurements)

- collect primary data using field techniques, including: surveys and interviews, observing and recording, listening, questioning, sketching and annotating, measuring and counting, photographing and note-taking
- collate field data using techniques, including: listing, tabulating, report writing, graphing, constructing diagrams and mapping
- analyse and interpret primary data