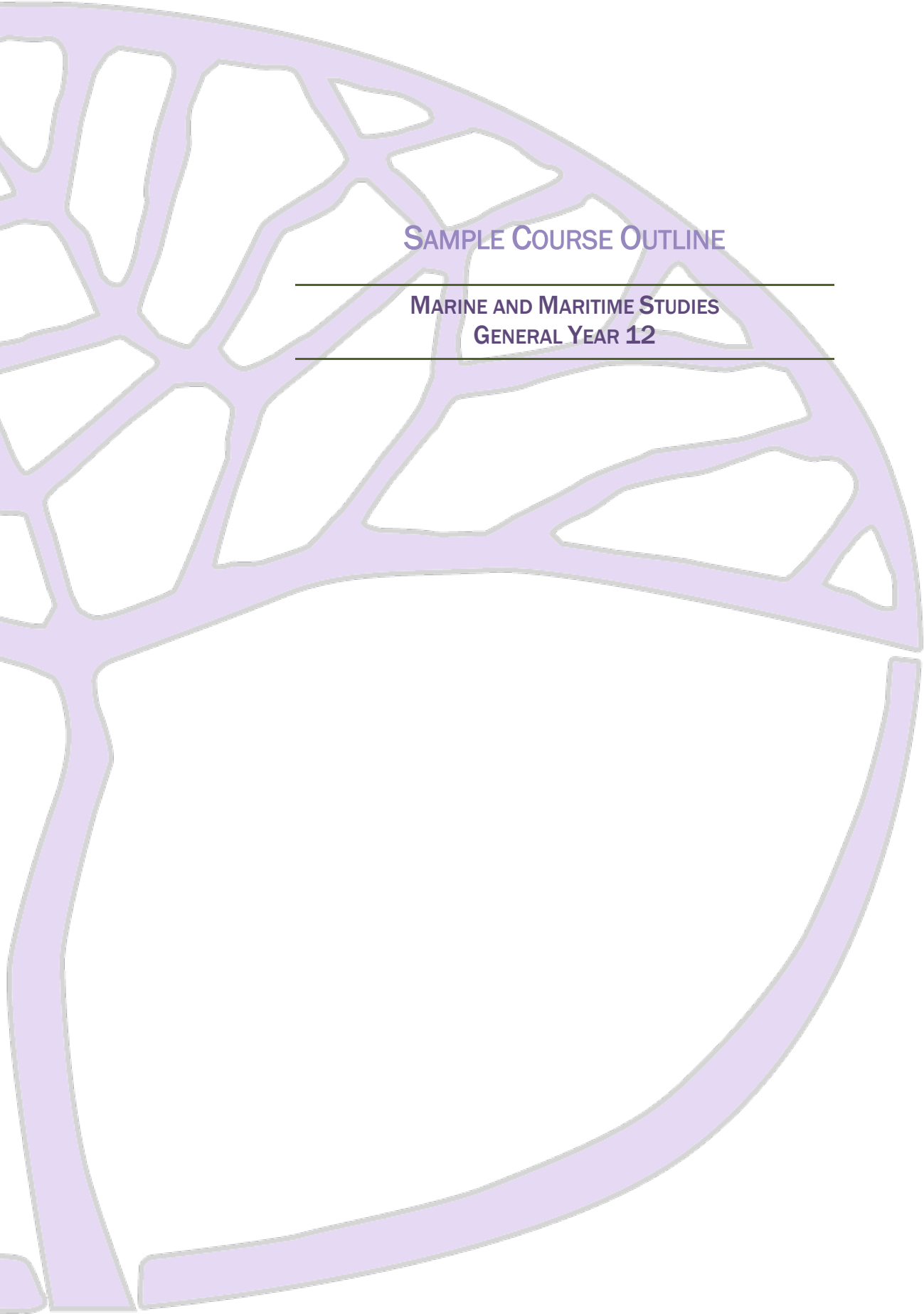




SAMPLE COURSE OUTLINE

MARINE AND MARITIME STUDIES GENERAL YEAR 12



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Sample course outline

Marine and Maritime Studies – General Year 12

Unit 3 and Unit 4

Science Inquiry Skills

Science Inquiry Skills align with the Science Understanding and Science as a Human Endeavour content of the unit and are integrated into the learning experiences.

- construct questions for investigation; propose hypotheses; and predict possible outcomes
- plan investigations, including the procedure/s to be followed, the materials required, and the type and amount of data to be collected; assess risk and address ethical issues associated with these methods
- conduct investigations, including using ecosystem surveying techniques and line transects, and measurement of coastal erosion, safely, competently and methodically for the collection of reliable data
- represent data in meaningful and useful ways; organise and analyse data to identify trends, patterns and relationships; qualitatively describe sources of measurement error and inconsistencies in data; and use evidence to make and justify conclusions
- interpret a range of scientific and media texts, and evaluate the conclusions by considering the quality of available evidence
- construct and use appropriate representations, including classification and charts of global currents and weather patterns keys to communicate conceptual understanding, solve problems and make predictions
- communicate scientific ideas and information for a specific purpose, using appropriate language, nomenclature and formats, including scientific reports

Semester 1

Week	Syllabus content
1–3	<p>Structure of the syllabus</p> <ul style="list-style-type: none"> • course outline • assessment outline <p>Marine: Oceanography</p> <ul style="list-style-type: none"> • location and characteristics of Western Australian marine ecosystems, including estuaries, mangroves, coral reefs and seagrass meadows • classification of key species relevant to the Western Australian ecosystems studied • food chains and webs relevant to the ecosystems studied • adaptations of organisms living in mangrove ecosystems • construction and use of simple apparatus that can be used to measure abiotic factors of a marine ecosystem • methods of measuring biotic factors, such as transects and quadrats <p>Task 1: Scientific skills – Classification of key species Task 2: Investigation – Measurement of biotic and abiotic factors Task 3: Test – Oceanography</p>
4–5	<p>Marine: Environmental and resource management</p> <ul style="list-style-type: none"> • aquaculture as a solution to declining fish stocks • aquaculture management by the relevant Western Australian Government agencies • Western Australian aquaculture regions and key species farmed • Southeast Asia has a long history of aquaculture, but rapid expansion did not start until after the mid-1970s, with output of food fish exceeding five million tonnes in 2005 (SHE) <p>Task 4: Extended response – Evaluation of information about WA aquaculture</p>

Week	Syllabus content
6–8	<p>Maritime: Design</p> <ul style="list-style-type: none"> • characteristics of maritime construction materials; for example, wood, metals, metal alloys, fibreglass, carbon fibre and plastic • maritime equipment, marine or watercraft, design and construction; for example, surfboards, boat hulls and anchors • repair process and maintenance of fibreglass craft <p>Task 5: Investigation – Comparing characteristics of marine construction materials Task 6: Practical – Construction of a model of a watercraft</p>
9–10	<p>Maritime: Small craft</p> <ul style="list-style-type: none"> • the outboard motor – basic parts, function, operating temperature, compression, horsepower • features of two-stroke and four-stroke motors • features of small craft systems • equipment care and maintenance
11–12	<p>Powerboating: Trip planning</p> <ul style="list-style-type: none"> • boat preparation – safety equipment check, ramp etiquette, launch and recovery of a vessel • components of weather – temperature, rainfall, wind, clouds, seas and swell, storms and cyclones • marine weather forecasts – bureau of meteorology and other models • weather map and forecast interpretation • log on, log off • chart symbols, chart types and local boating guides • accurate weather forecasting is vital to the public and private sectors. There is a huge demand to increase the accuracy and reliability of weather forecasting over longer periods of time. Weather predictions are based on interpretation of changes in factors. Contemporary weather predictions are informed by computer models, but still rely on human input to determine the best forecast model, and to interpret the model data into weather forecasts that are understandable to the end user (SHE) <p>Task 7: Test – Trip planning</p>
13	<p>Powerboating: Rules and regulations</p> <ul style="list-style-type: none"> • skipper’s responsibilities and duty of care – new crew induction, sinking, breakdown, fire, grounding, health-related problems, man overboard, search for and rescue a man overboard, collision, capsize, abandon ship, grab bags, survival in water, duties of passengers/crews, code of conduct, rules, reporting of accidents • registration of vessels • port authority; licensing; recognition of operational areas and commercial regulations, including certificates of operation and certificates of competency
14–15	<p>Powerboating: Safety equipment</p> <ul style="list-style-type: none"> • mandatory safety equipment – bilge pump, fire extinguisher, anchor, life jacket, flares, emergency positioning indicator radio beacon (EPIRB), parachute flares, marine radio (VHF, 27 MHz) • safety equipment expiry dates, care and maintenance, stowage and accessibility • non-mandatory safety equipment – chart, first-aid kit, minor tool kit, knife, mask and snorkel, torch, clothing, extra lines (ropes), sunscreen, water and extra fuel • distress signals – radio (mayday, pan-pan, securite), emergency positioning indicator radio beacon (EPIRB), flares and phone <p>Powerboating: Collision avoidance</p> <ul style="list-style-type: none"> • IALA buoyage (System A) – lateral, cardinal, special, isolated danger, safe water, wreck, marine safety signs and leads (sector light) • rules and regulations for preventing collisions within navigable waters • maritime communication systems, including distress signals and rules and regulations for avoiding collisions within navigable waters, are based on international conventions, and are subject to change through debate and resolution (SHE)

Week	Syllabus content
	Powerboating: Maintenance <ul style="list-style-type: none"> • routine checks – electrical, fuel, cooling system, oil and propellers Task 8: Externally set task

Semester 2

Week	Syllabus content
1–3	Marine: Oceanography <ul style="list-style-type: none"> • global surface ocean currents – names, locations, role in energy transfer • impacts of global atmospheric circulation systems (El Niño, La Niña) on weather patterns and nutrient upwelling • identification of cyclical changes in global atmospheric circulation systems (El Niño, La Niña) require systematic collection and analysis of data to reveal patterns over time (SHE) • impact of climate change on global sea levels, thermohaline current and marine habitats; for example, coral reefs • the global ocean conveyor is important in regulating global climate. The global ocean conveyor is partly driven by thermohaline circulation. The places where these deepwater currents are created are believed to compose less than 1% of the ocean’s surface area. Analysis of geological evidence indicates that when these areas are disrupted, the global ocean conveyor can be “shut down” and the world’s climate can be drastically altered in just a few years. Some scientists predict that melting of the Greenland ice sheet could influence the global ocean conveyor, causing changes in global climate (SHE) • cause, effect and measurement of coastal erosion, including longshore currents, accreting and eroding beaches, deposition and sand budgets • features, role and impact of coastal engineering structures; for example, physical barriers, sand bypass systems • artificial reefs, ports and canals Task 9: Test – Oceanography
4–6	Marine: Environmental and resource management <ul style="list-style-type: none"> • types of marine tourism activities in Western Australia • ecotourism and its importance in the maintenance of marine area integrity • potential impacts of marine tourism, including environmental, social and economic effects
7–11	Maritime: Design <ul style="list-style-type: none"> • common forms of construction material protection used in marine craft • possible side effects of construction material protection methods; for example, copper and antifouling agents Maritime: Small craft <ul style="list-style-type: none"> • maintenance log – use, purpose • effect of poor marine craft maintenance on the marine environment • fuel and ignition – petrol/oil mix, petrol and diesel • cooling system – basic operation, checks, tell-tale • engine diagnostics • management of engine failure in small craft – protocols/procedures Task 10: Extended response – Protection of marine construction materials Task 11: Test – Maritime design and small craft
12–15	Powerboating <ul style="list-style-type: none"> • operating a vessel safely • using berthing and mooring equipment • tying knots – reef, bowline, sheet bend, clove hitch, round turn and two half hitches, coiling, throwing a line, using bits and cleats • conducting a safety briefing

Week	Syllabus content
	<ul style="list-style-type: none">• preparation and starting of motors• skipper's logging on and logging off• departing the berth• performing a man overboard• driving a transit• performing a controlled stop• returning to the berth: securing a vessel <p>Task 12: Practical – Knot board</p> <p>Task 13: Practical – Knot tying skills assessment</p> <p>Task 14: Practical – Powerboating skills test</p>