

MED2 NEAR COASTAL – YOUR STUDY CHECKLIST

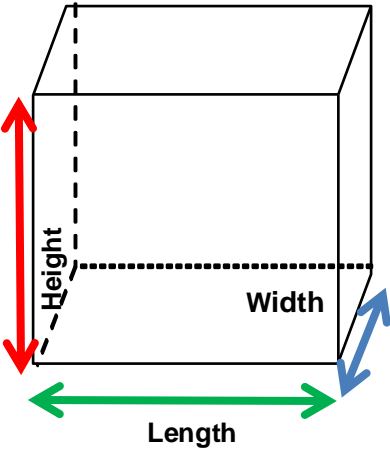
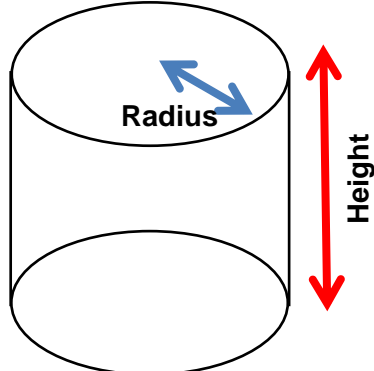
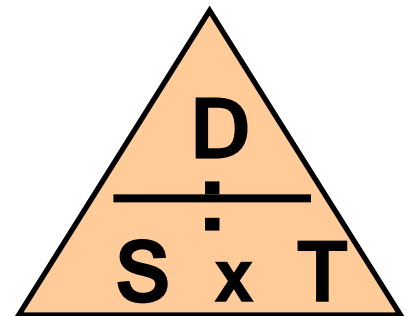
View the full [Skills & Knowledge](#) required for National Standard for Commercial Vessels Orals

Competent	More study	
Outcome	Content	Standards for evaluating (extracts)
Table 2 Outcome Elements of Shipboard Safety Safety and Emergencies including survival craft	Safety and Emergencies	
		Apply basic survival skills
		Survive at sea using survival craft
		Fire minimization/fire-fighting
		Risk management & SMS Meet WHS requirements (confined spaces)
		<ul style="list-style-type: none"> • Practice survival techniques • Operate lifesaving and survival equipment • Undertake/understand risk manage/SMS • Follow safety procedures and take action • Understand/ follow fire minimisation procs • Respond to and fight fires with portable and other fire-fighting appliances including correct use of vessel closure and shutdown systems • Identify/respond to confined space risks
Competent	More study	
Outcome 11.8 Demonstrate actions fire/explosion Describe operation/maint of ER equip Outcome 12.9 Demonstrate knowledge of the precautions against fire and explosion & methods of dealing with fires	Firefighting	
		Causes, fire triangle, explosion, corrosion
		Minimisation of hazards
		Recognition/uses of portable fire extinguishers
		Fire-fight sys identification & maintenance
		Alarm sys/panels, heat/smoke detectors
		Fixed f-fighting installations, valves closures
		Using fire pumps, mains hoses & nozzles
		Safety precautions during a watch
		Equipment use, management/control of fires
	Personnel safety	
	Control- passenger/crew/comms/instructions	
		<ul style="list-style-type: none"> • Fire control is implemented in accord with maritime safety and vessel op procs whilst maintaining crew safety, vessel stability & operational capability • Actions taken to control fires are based on full/accurate assessment using all info • Priority, timing and actions sequence appropriate to the overall requirements of the incident & minimise damage/potential damage to vessel, injuries to personnel & impairment of the op effectiveness • Maintenance of fire-fighting appliances is in accordance with manufacturer's specs • Alarms are actioned, recorded and reported according to vessel procedures and marine safety requirements
Competent	More study	
Outcome 11.9 Demonstrate know/principles of stowage & management Outcome 12.8 knowledge of safe handling LPG, fuels	Stowage of Flammables	
		Stowage/management
		Dangers with LPG/petrol vapour/flammables
		Storage of LPG cylinders
		Testing of LPG detectors
	Safety procedures for vessel refuelling	
		<ul style="list-style-type: none"> • Stowage of flammable/explosive materials and management, accords with established rules and procs including liquids, gases, solids and other materials normally carried (spare fuel, lubricants, LPG, flares) • Flammable/explosive materials are stowed and managed in accordance with regulations and established rules and procedures
Competent	More study	
Table 3 Outcome Environment Follow environmental work practices	Writing reports	
		Environmental workplace practices
		Maintain environmental records
	Precautions to prevent pollution & oil spill	
		<ul style="list-style-type: none"> • Identify safe and environmentally acceptable practices for refuelling cleaning up fuel or oil spills. Understanding garbage, sewage, noise, anchoring or marine life and other environmental maritime responsibilities • Antipollution procedures and equipment
Competent	More study	
Outcome 11.10 Maintain logs written reports 12.13 Calculate fuel consumption speed/ range	Environ Responsibilities Calculations	
		Writing of simple reports
		Keep running and maintenance logs
		Calculate capacity/consumption/duration Conversion of volumes to litres, SG, Specific fuel consumption speed and range
		<ul style="list-style-type: none"> • Running and maintenance logs are completed to vessel & maritime procedures including regular reports • Calculations for fuel capacity, consumption and voyage duration • Calculations - bunkering capacity, fuel, speed, range of a vessel are carried out and accurate to accepted working tolerances
Competent	More study	
Outcome 11.11 Work with others	Work in a group environment	
		Promote team commitment & cooperation,
		<ul style="list-style-type: none"> • Work effectively as part of a crew support members, deal with issues, problems and conflict

Competent	More study		
<p>Outcome 11.1 Demonstrate knowledge of the construction, operation and service of marine internal combustion engines</p> <p>Outcome 12.1 Operate and carry out basic user maintenance of marine internal combustion engines</p> <p>Outcome 12.2 Operate and carry out basic user maintenance of lubricating oil and cooling-water systems</p>	<p align="center">Engineering - Basic + Med 2</p> <p>Marine 2 – and 4 – stroke petrol/diesel engines construction operation/routine maintenance Basic combustion process</p> <p>Petrol/diesel fuel storage and management</p> <p>Tank components, measure, fill, condensation</p> <p>Slack tanks & stability</p> <p>Carburettors- Air filters</p> <p>Diesel injection, timing diagrams/control equip</p> <p>Turbo arrangements & supercharging</p> <p>Basic governor operation</p> <p>Engine protection arrangements</p> <p>Operational practice</p> <p>Performance & fault-finding procedures</p> <p>Maintenance, filters, fault finding & emergency</p>		<ul style="list-style-type: none"> • Parts of marine internal combustion engines identified in accord with manuals • 2/4 stroke cycles explained in compliance with manufacturer's specs • Fuel systems managed safely in accordance with regs, manufacturer's instructions and vessel procs to prevent pollution • Marine i.c. engines operated to tech specs • Ops/surveillance of main prop plant and aux systems is sufficient to maintain safe operating conditions • Basic operational faults are recognised/repared or maintenance assistance is organised Maintenance accords with vessel plan, procs and manufacturer's recommendation • Records are maintained in compliance with regulations and vessel recordkeeping procedures
<p>Outcome 12.5 Operate and manage fuel and fuel oil systems</p> <p>Outcome 12.6 Demonstrate knowledge of the principles of oil and grease lubrication systems</p>	<p align="center">Cooling systems</p> <p>Keel cooling/heat raw water cooling systems</p> <p>Construction/maintenance heat exchangers</p> <p>Circulation, pumps and thermostats</p> <p>Ship's side valves</p> <p>Maintenance & Corrosion</p> <p>Instrumentation</p> <p>Emergency procedures</p>		<ul style="list-style-type: none"> • Cooling systems are operated in accordance with established procedures and prevent pollution of the marine environment • Cooling systems are managed in accordance with manufacturer's recommendations and established procedures
	<p align="center">Lubricating systems</p> <p>Dry sump and wet sump lubrication</p> <p>Lube oil system components</p> <p>Cooling effects, function of oil & grease</p> <p>Lube sys pressure/flow/conditions/problems</p> <p>Lube oil contamination</p> <p>Lube oil management/maint & filter change</p> <p>System quality monitoring/ instrumentation</p> <p>Refuelling operations (enviro, safety, regs)</p>		<ul style="list-style-type: none"> • The basic principles of lubrication are described in accordance with engineering principles • Lubricating systems are operated & managed in accordance with established procedures and prevent pollution of the marine environment • Maintenance is undertaken in accordance with vessel maintenance plan, vessel procedures and manufacturer's recommendations • Recordkeeping procedures are compliant with regulations

Competent		More study			
<p>Outcome 11.2 Demonstrate knowledge of the workings of marine prop systems</p> <p>Recognise and takes steps to rectify basic operational faults</p> <p>Outcome 12.12 Demonstrate knowledge of the methods of propulsion reversal</p>	Power Transmission			<ul style="list-style-type: none"> • Marine propulsion systems components are identified and functions explained in simple terms • Describe the operation and servicing of propulsion system within the technical specifications • Basic operational faults are recognised and repair or maintenance assistance is organised • Method of propulsion reversal and the operation of marine gearboxes is in accordance with technical specifications 	
			Gearbox-reverse/reduction & gear train		
			Gearbox-lube/cooling/filters/strainers		
			Propeller and intermediate shafting alignment		
			Bearing types, materials, installation, lube		
			Shaft seals and glands, packing		
			Couplings types, fitting, keys and keyways		
			Prop types-fitting/keys/locking/cont.pitch		
			Stern drive and water jet drive units		
		Maintenance/inspection/vibration/wear			
		Fault identification & emergency operation			
Competent		More study			
<p>Outcome 11.4 Identify and operate components of auxiliary systems</p> <p>Outcome 12.4 Operate and carry out basic user maintenance of steering gear</p> <p>Outcome 12.3 Operate and carry out basic user maintenance of pumps, bilge and seawater systems</p> <p>Outcome 12.8 Demonstrate safe handling knowledge of ... refrigerant gases</p> <p>WARNING: Relevant Commonwealth, local and State / Territory training and qualification requirements need to be fulfilled by any persons carrying out installation, maintenance and / or repair of refrigeration equipment especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work.</p>	Steering Systems			<ul style="list-style-type: none"> • Steering arrangements are operated in accordance with manufacturer's instructions, operational procedures and regulations • Maintenance is arranged in accordance with the tech specs • Emergency steering checks accord with vessel maintenance plan, procs and manufacturer's recommendations • Records are maintained in compliance with regulations and vessel recordkeeping procedures 	
			Rudder construction and rudder types		
			Rudder & stock bearings/glands, packing, seal		
			Tiller arm attachment		
			Operation- rod & gear/cable/hydraulic electro hydraulic		
			Testing/maint of steering, hydraulic systems		
			Emergency steering checks		
		Pumping Systems			<ul style="list-style-type: none"> • Pumping systems are operated in accordance with manufacturer's instructions, operational procedures and regulations to ensure safety of operation and prevention of pollution of the marine environment • Maintenance is arranged in accordance with the technical specifications • Records are maintained in compliance with regulations and vessel recordkeeping procedures
			Seawater/fire/bilge/tank circulating systems		
			Bilge arrangements vessels with compartments		
			Pumps- safety devices, capabilities, priming Use of flexible materials, hoses, etc.		
			Drive systems, belts, clutches, motors		
		Valves - construction, servicing, back-flooding Dangers & methods to prevent back-flooding Strainers, mud boxes, foot valves			
		Dual duty systems/cross connection between bilge/ballast/seawater systems and fire main			
		Fault id, maintenance, prevent corrosion			
		Environmental regs & responsibilities			
	Refrigeration systems			<ul style="list-style-type: none"> • Refrigeration sys is op/maintained in accord with manufacturer's recs, regs & vessel op procs to ensure safety & pollution prevention of t environment • Refrigerant gases are stowed & managed in accordance with regs and Aus Standards 	
		Hazards of refrigerant gases			
		Identification of components			
		Environmental responsibilities			

Competent		More study	
Outcome 11.5 Operate electrical sys Outcome 12.7 Safely operate and carry out simple maint of electrical sys WARNING Relevant State/Territory electrical licensing requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of electrical circuits or systems that are 50 v A.C. or above, OR 120 v DC or above, on a vessel.	Direct Current Systems not exceeding 32 V DC		<ul style="list-style-type: none"> • DC systems are operated and operator preventative maintenance in accordance with manufacturer's recommendations, regulations and vessel operating procedures to ensure safe operation.
	<input type="checkbox"/> Electrical systems – Basic care/fault recognition <input type="checkbox"/> Batteries – types/care/maintenance/hazards/connecting/series/parallel <input type="checkbox"/> Charging systems – regulators/alarms/indicators <input type="checkbox"/> Fuses/circuit breakers –select correct capacity <input type="checkbox"/> Op/maint – Starters/alternators/associated equipment.		
	Electric Systems above 32 V DC and up to 415 V AC		<ul style="list-style-type: none"> • Electrical systems are operated in accordance with manufacturer's recommendations, regulations and vessel operating procedures to ensure safe operation • Electrical system faults are recognised and where necessary steps are taken to make them immediately safe • Records are maintained in compliance with regulations and vessel recordkeeping procedures
	<input type="checkbox"/> Electrical distribution systems <input type="checkbox"/> Single and three phase AC power <input type="checkbox"/> Faults with electrical systems <input type="checkbox"/> Fault id, location, and safety implications <input type="checkbox"/> Switchboards, earth indicating devices <input type="checkbox"/> Protection devices, isolation of circuits <input type="checkbox"/> Multi-meter testing for voltage & continuity <input type="checkbox"/> Personal safety <input type="checkbox"/> Connection to shore power		
Competent		More study	
Outcome 11.6 Use deck machinery	Use of deck machinery		<ul style="list-style-type: none"> • Lifting equipment and deck machinery is operated and user-maintenance is carried out in accordance with manufacturer's recommendations, regulations and vessel operating procedures
	<input type="checkbox"/> Lifting equipment <input type="checkbox"/> Winches, capstans <input type="checkbox"/> Safe working procedures <input type="checkbox"/> Basic hydraulic systems, operation/user-maint <input type="checkbox"/> Legislation affecting lifting equipment		
Outcome 11.7 Demonstrate basic hull maint knowledge Outcome 12.10 Recog/correct deteriorated fittings/mach	Deterioration & hull maintenance		<ul style="list-style-type: none"> • Maintenance procedures and techniques for hulls are in accordance with regs and operating procedures • Maintenance activities are planned in accordance with technical, legislative, safety and procedural specifications • Maintenance is carried out in compliance with manufacturer's specifications
	<input type="checkbox"/> Basic hull inspection and maintenance <input type="checkbox"/> Corrosion, prevention, sacrificial anodes <input type="checkbox"/> Pipework repairs <input type="checkbox"/> Recognition/measure of tail shaft wear down <input type="checkbox"/> Machinery log keeping		
Competent		More study	
Outcome 11.3 Prepare vessel machinery for sea Outcome 12.11 Prepare a vessel for sea and secure a vessel after a voyage	Prepare for sea, engine watchkeeping		<ul style="list-style-type: none"> • Prep for start-up inc. fuel, lube, cooling & air comply with vessel op procs. and manufacturer recommend. • Checks of pressures, temp & revs during start/warm-up accord with the tech specs • Prep for shut-down & supervise the cool down of the engine are in accord with op procs. & manufacturer recommendations. • Vessel and machinery are prepared for sea and secured after voyage in accordance with ship and manufacturer's procedures
	<input type="checkbox"/> Inspection/checks main/aux mach. & spaces <input type="checkbox"/> Spares/ stores required for proposed voyage <input type="checkbox"/> Preparations/checks necessary before sailing <input type="checkbox"/> Start-up procedures <input type="checkbox"/> Instrumentation <input type="checkbox"/> Running checks <input type="checkbox"/> Keeping of running and maintenance logs <input type="checkbox"/> Shut down procs, securing after voyage		

Competent	More study	
Outcome 11.10 Working out simple calculations for fuel capacity, consumption and voyage duration MARC001 Converting units to multiples of base units, fractions to decimals, volume/capacity of regular shaped tanks, consumption of fuel /lube oil, hourly fuel consumption, theoretical steaming times/distances, the area of circle, RD/SG to convert quantity in litres and volume to mass		
1. Calculate specific fuel consumption in gms/bhp/hour for an engine using 100 litres per hour at 2000 rpm and producing 300 HP. Use specific gravity 0.8.		$80000/(300 \times 1) = 267 \text{ g/bhp/hr}$
2. Calculate amount of fuel in litres in a rectangular tank 1.0m x 1.0m x 1.0m with an ullage of 0.2 or 0.5 or 0.7 m from the top of the tank.		800 litres, 500 litres or 300 ltrs
3. Calculate amount of fuel in litres in a circular tank with a diameter of 500 mm, height of 1 metre and a sounding of 200 mm from top of the tank.		$(3.14/4) \times 0.5 \times 0.5 \times 0.8 \times 1000 = 157 \text{ litres}$
4. What is the time taken to travel 200 miles at 10 knots? What is the weight of fuel required if the single engine's rated specific fuel consumption at 250 kW is 0.25ltr/kW/hr? Allow 25% reserve. The fuel's specific gravity is 0.8.	$\text{Volume of cylinder} = \pi r^2 h$ $\pi = 3.142$	$200/10=20\text{hr. } 20+25\%=25\text{hr}$ $25\text{hr} \times 250 \times 0.25 = 1562.5 \times 0.8 = 1250\text{kilo}$
5. What is the time taken to travel 400 miles at 20 knots? What is the weight of fuel required if the single engine uses 15ltr/hr? Allow 25% reserve. The fuel's specific gravity is 0.8.		$400/20=20\text{hr. } 20+25\%=25\text{hr}$ $25\text{hr} \times 15 = 375 \times 0.8 = 300\text{kilo}$
6. What is the time taken to travel 150 miles at 15 knots? What is the safe weight of fuel required if the twin engines use 9ltr/hr each? Allow 25% reserve. The fuel's specific gravity is 0.8.		$150/15=10\text{hr. } 10+25\%=12.5\text{hr}$ $12.5\text{hr} \times 9 = 112.5 \times 0.8 = 90\text{kilo}$
7. A vessel routinely uses 175 litres on its daily 7 hour passage? Today the tank was sounded pre start-up (332 litres) and on return (147 litres). How much fuel was used today? Explain why?		$332 - 147 = 185 - 175 = +10$ Tide, wind, fouling, tuning
8. What is the safe amount of fuel required for a voyage of 100 miles and return, if the specific fuel consumption is 250 gm/bhp/hr and engine is producing average 250 bhp with a speed of 10 knots over the entire voyage. S.g. = 0.8		$250 \times 250 / (0.8 \times 1000) = 76 \text{ ltr/hour}$ $200/10 = 20 \text{ hours}$ $\text{qty} = 76 \times 20 = 1520 \text{ ltr.}$ Safety margin, add 25% $Q = 1.25 \times 1520 = 1900 \text{ ltr.}$