



Maritime &
Coastguard
Agency

Consultation Report: Cadet Training & Modernisation Programme Syllabus Review – First Group of Consultation Templates

May 2023

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Foreword

The Maritime and Coastguard Agency (MCA), an executive Agency of the Department for Transport (DfT), carried out a public consultation on behalf of the Cadet Training and Modernisation (CT&M) Programme from 23 January to the 20 February 2023 regarding the Cadet Training Syllabus Review. The consultation was published on 23 January 2023 and notification of the consultation was sent to all participants of the CT&M Programme for wider dissemination through the maritime industry. This was also promoted on social media platforms and maritime news outlets.

The proposed amendments to the Cadet training syllabus were published in multiple formats and feedback on these amendments was gathered through surveys hosted on Smart Survey.



1 Key Findings

1.1 Introduction

- 1.1.1 Through the process of the consultation, it has been found that the majority of survey respondents agreed with the changes suggested by CT&M Sub-Group 1.2.



1.2 Consultation

- 1.2.1 The first consultation was carried out between 23 January and 20 February 2023 and can be found at: www.gov.uk
- 1.2.2 A total of 172 responses were received across the eight templates. With all respondents answering every question posed on their survey. A summary of consultee responses and the action taken by CT&M Sub-Group 1.2 as a result can be found in **Annex A**. A more detailed summary can be found in the accompanying 'Detail of feedback received' section of the consultation page. The answers given have been fully and carefully considered.
- 1.2.3 This consultation has been completed in order to ensure best practice has been followed and provide the opportunity for feedback from the entire maritime industry. There was no legal requirement to undertake this consultation.



Consultation Outcome



2 Summary of responses

2.1 Introduction

- 2.1.1 A total of 28 outcomes over eight templates were posed in the first consultation.
- 2.1.2 These outcomes, together with the consultees comments and the Cadet Training & Modernisation Sub-Group 1.2's response, are shown in detail in the accompanying 'Detail of feedback received' section of the consultation page. However, the main points are summarised below at Annex A.
- 2.1.3 Finalised versions of each module can also be found in the 'Detail of outcome' section of the consultation page.



3 Our response

3.1 What happens next?

- 3.1.1 The MCA will make the appropriate amendments to the syllabus templates. These will then be used to create academic modules that will form the new Cadet training syllabus with a view to complete this process by the end of 2023.
- 3.1.2 Once these academic modules have been created, it will take approximately 12 to 18 months to implement the new syllabus.
- 3.1.3 Cadet Assessment and the Training Record Book will also be amended to reflect these changes.



ANNEX A

SUMMARY OF THE CONSULTATION OUTCOMES, CONSULTEE FEEDBACK AND SUB-GROUP 1.2 RESPONSES TO THE FEEDBACK

Each module had its own survey which included the recommendations of Sub-Group 1.2:

Deck – Chartwork and Tides			
Outcome	Sub-Group 1.2 Recommended Action	Consultation Support %	Changes made as a result of industry feedback
Outcome 1: Identify recommended procedures to ensure that all charts and publications are maintained and corrected.	This entire module should be renamed. A greater emphasis should be placed on electronic resources.	91%	None
1.1 Type of charts	Modernisation is essential.	96%	“Include a variety of chart projections” moved to this sub-outcome from sub-outcome 2.1 as it is a more appropriate place to cover.
1.2 Carriage of nautical publications	Modernise	91%	None
1.3 Storage and handling of charts	Remove	87%	None
1.4 Procedures for ordering charts and publications	Remove	75%	None
1.5 Correction logs for charts and publications	Keep	95%	None
1.6 Contents and use of chart catalogue	Amend	93%	None
1.7 Weekly and cumulative lists of admiralty notices to mariner	Amend	96%	None

1.8 Commercial systems for maintaining charts and publications	Keep	95%	None
Outcome 2: Use Mercator charts for visual position fixing methods	Modernise	95%	None
2.1 Navigational properties of a Mercator chart	Modernise	95%	“Include a variety of chart projections” moved to sub-outcome 1.1 from this sub-outcome as it is a more appropriate place to cover.
2.2 Plotting positions on a chart	Modernise	95%	None
2.3 Chart symbols	Modernise	96%	None
2.4 True, gyro and compass courses	Keep	96%	None
2.5 Chartwork techniques to determine position	Modernise	95%	None
2.6 Dead reckoning and estimated positions using water and ground tracks	Keep	95%	None
2.7 Estimated Time of Arrival (ETA) to reach a given position	Keep	96%	None
Outcome 3: Use chartwork techniques to amend and update the vessel’s passage plan.	Keep	96%	None
3.1 Principles of passage planning	Modernise	91%	Modernisation expanded to become an introduction to Voyage Optimisation, including SEEMP. As opposed to only covering SEEMP.
3.2 Appropriate regulations and guidelines in passage planning	Keep	98%	None
3.3 Adjustments to the vessel’s course and speed to take account of passage plan requirements	Keep	96%	Human factors required when evaluating a passage plan added

Outcome 4: Use tidal terminology and calculate times and heights of tides worldwide	Modernise	95%	None
4.1 Theory of tides and their causes	Keep	96%	None
4.2 Tidal definitions and calculations	Keep	93%	None
4.3 Admiralty tide tables and tidal software	Keep	96%	None
Outcomes for this competency, above and beyond STCW which would be needed due to use of modern technology and impact of future fuels onboard:			
How would you deliver this outcome/ objective?	How would you assess this outcome/ objective?	Action required	Consultation Support %
Ensure all outcomes are contextualised to help Cadets understand what they are learning in relation to what they will experience at sea.	While some outcomes are intrinsically linked to work carried out at sea, some need to be contextualised to show how they apply to work on board. Where this is the case, it is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and future seagoing technologies and practices.	Where outcomes do not specifically cover a topic which relates to work carried out at sea, more must be done to contextualise the outcome and make it relevant to the maritime industry, giving specific shipping examples of how the outcome may be applied in a modern shipping context. Not every template has contextualisation recommendations but please do add any you feel may have been missed.	95%
Include Human Element Factors throughout the syllabus	To provide seafarers with a contextualised understanding of the Human Element in the maritime industry, showing how they can put theory into practice in the work they carry out at sea.	Raise awareness throughout the Cadet's training of the areas in which human element factors will have an impact. Recommendations on where this can be included have been noted throughout the entire syllabus. Not every template has Human Element Factor recommendations but please do add any you feel may have been missed.	95%

<p>Include Data Science skills throughout the syllabus</p>	<p>Data Science Skills (Comprehension, Analysis, Presentation, etc...) are already required within much of the syllabus. A further, specific focus on these skills needs to be taught where relevant.</p>	<p>A specific topic will need to be introduced to improve Cadets' Data Science skills. Practical application of data science skills should be highlighted throughout the syllabus. Not every template has Data Science recommendations but please do add any you feel may have been missed.</p>	<p>93%</p>
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ETO - Mathematics for Engineering 1			
Outcome	Sub-Group 1.2 Recommended Action	Consultation Support %	Changes made as a result of industry feedback
Outcome 1: Solve problems involving functions and trigonometric equations.	Keep	100%	None
1.1 Properties of functions	Keep	100%	None
1.2 Inverse functions	Keep	100%	None
1.3 Composite Functions	Keep	100%	None
1.4 Trigonometric equations	Keep	100%	None
Outcome 2: Solve problems involving exponential and logarithmic equations	Keep	100%	None
2.1 Evaluation of logarithmic and exponential expressions	Keep	100%	None
2.2 Transposition from logarithmic to exponential form and vice versa	Keep	100%	None
2.3 Laws of logarithms	Keep	100%	None
2.4 Graphics of logarithmic and exponential functions	Keep	100%	None
Outcome 3: Evaluate the strength of materials in a range of engineering environments	Keep	100%	None
3.1 Collinearity	Keep	100%	None
3.2 Addition, subtraction and scalar multiplication of vectors	Keep	100%	None
3.3 Scalar product	Keep	100%	None
3.4 Conversion of complex numbers between rectangular and polar form Addition and subtraction of complex numbers	Keep	100%	None
3.5 Multiplication and division of complex numbers	Keep	100%	None

3.6 Representation of complex numbers on an Argand Diagram	Keep	100%	None
Outcomes for this competency, above and beyond STCW which would be needed due to use of modern technology and impact of future fuels onboard:			
How would you deliver this outcome/ objective?	How would you assess this outcome/ objective?	Action required	Consultation Support %
Ensure all outcomes are contextualised to help Cadets understand what they are learning in relation to what they will experience at sea.	While some outcomes are intrinsically linked to work carried out at sea, some need to be contextualised to show how they apply to work on board. Where this is the case, it is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and future seagoing technologies and practices.	Where outcomes do not specifically cover a topic which relates to work carried out at sea, more must be done to contextualise the outcome and make it relevant to the maritime industry, giving specific shipping examples of how the outcome may be applied in a modern shipping context. Not every template has contextualisation recommendations but please do add any you feel may have been missed.	88%
Include Human Element Factors throughout the syllabus	To provide seafarers with a contextualised understanding of the Human Element in the maritime industry, showing how they can put theory into practice in the work they carry out at sea.	Raise awareness throughout the Cadet's training of the areas in which human element factors will have an impact. Recommendations on where this can be included have been noted throughout the entire syllabus. Not every template has Human Element Factor recommendations but please do add any you feel may have been missed.	75%
Include Data Science skills throughout the syllabus	Data Science Skills (Comprehension, Analysis, Presentation, etc...) are already required within much of the syllabus. A further, specific focus on these skills needs to be taught where relevant.	A specific topic will need to be introduced to improve Cadets' Data Science skills. Practical application of data science skills should be highlighted throughout the syllabus. Not every template has Data	63%

		Science recommendations but please do add any you feel may have been missed.	
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Marine Engineering - Thermodynamics			
Outcome	Sub-Group 1.2 Recommended Action	Consultation Support %	Changes made as a result of industry feedback
Outcome 1: Calculate and explain the effect of applying heat energy to solids and liquids	Keep	93%	None
1.1 Heat energy, sensible heat, latent heat.	Keep	93%	None
1.2 Resultant temperature when a solid is placed in a liquid at a different temperature.	Keep	93%	None
1.3 Resultant temperature when up to three liquids at different temperatures are mixed.	Keep	93%	None
1.4 Coefficient of linear expansion and coefficient of cubical expansion	Keep	93%	None
1.5 Heat transfer by conduction, convection, radiation.	Keep	93%	None
1.6 Heat transfer through a composite wall of no more than three flat layers in contact.	Keep	86%	None
Outcome 2: Apply the Gas Laws for thermodynamic systems and evaluate the work done.	Modernise	86%	None
2.1 Ideal gas laws	Keep	93%	None
2.2 Isothermal, adiabatic and polytropic processes process diagrams	Keep	93%	None
2.3 Specific heat capacities of a gas at constant pressure and at constant volume.	Keep	93%	None

2.4 Change in internal energy	Keep	93%	None
2.5 Steady flow processes	Keep	93%	None
2.6 Non-flow processes	Keep	93%	None
Outcome 3: Explain and analyse combustion cycles associated with Marine Engines.	Keep	93%	None
3.1 Ideal Cycles associated with Marine Heat Engines	Modernise	93%	None
3.2 Practical cycles associated with Marine Heat Engines	Modernise	93%	None
3.3 Indicated and brake powers	Modernise	86%	None
3.4 Thermal and mechanical efficiency	Keep	86%	None
3.5 calorific values	Keep	93%	None
— Exhaust gas products — stoichiometric air conditions			
— Exhaust gas products — excess air conditions			
Outcome 4: Apply the data from Property Tables to solve thermodynamic process problems.	Keep	93%	None
4.1 Refrigerant and insulation material	Keep	93%	None
4.2 Principle components of a vapour compression vapor system	Keep	93%	None
4.3 P-H diagram to describe the quality of a refrigerant or steam	Keep	100%	None
4.4 Property tables to determine the specific enthalpy and specific volume of wet, dry and superheated working fluids	Keep	100%	None

4.5 Coefficient of performance and capacity	Keep	100%	None
4.6 Change of phase diagram for ice, water and steam	Keep	100%	None
4.7 Final condition of a vapour after throttling	Keep	93%	None
Outcomes for this competency, above and beyond STCW which would be needed due to use of modern technology and impact of future fuels onboard:			
How would you deliver this outcome/ objective?	How would you assess this outcome/ objective?	Action required	Consultation Support %
Ensure all outcomes are contextualised to help Cadets understand what they are learning in relation to what they will experience at sea.	While some outcomes are intrinsically linked to work carried out at sea, some need to be contextualised to show how they apply to work on board. Where this is the case, it is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and future seagoing technologies and practices.	Where outcomes do not specifically cover a topic which relates to work carried out at sea, more must be done to contextualise the outcome and make it relevant to the maritime industry, giving specific shipping examples of how the outcome may be applied in a modern shipping context. Not every template has contextualisation recommendations but please do add any you feel may have been missed.	93%
Include Human Element Factors throughout the syllabus	To provide seafarers with a contextualised understanding of the Human Element in the maritime industry, showing how they can put theory into practice in the work they carry out at sea.	Raise awareness throughout the Cadet's training of the areas in which human element factors will have an impact. Recommendations on where this can be included have been noted throughout the entire syllabus. Not every template has Human Element Factor recommendations but please do add any you feel may have been missed.	100%
Include Data Science skills throughout the syllabus	Data Science Skills (Comprehension, Analysis, Presentation, etc...) are already	A specific topic will need to be introduced to improve Cadets' Data Science skills. Practical	93%

	required within much of the syllabus. A further, specific focus on these skills needs to be taught where relevant.	application of data science skills should be highlighted throughout the syllabus. Not every template has Data Science recommendations but please do add any you feel may have been missed.	
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Deck - Bridge Watchkeeping			
Outcome	Sub-Group 1.2 Recommended Action	Consultation Support %	Changes made as a result of industry feedback
Outcome 1: Interpret and apply regulations and systems for the safe movement of vessels.	Keep	97%	None
1.1 Application and Interpretation of the IRPCS	Keep	95%	Added “relevant Human Element Factors” to this outcome
1.2 Application and Interpretation of the IALA Buoyage systems	Keep	97%	Added “relevant Human Element Factors” to this outcome
Outcome 2: Describe operational and emergency bridge watchkeeping procedures.	Keep	100%	Included the suggestion to use simulators to enhance this outcome and highlight Human Element Factors, where relevant
2.1 Bridge watchkeeping procedures itemised in: — current national regulations — international regulations — international and national guidelines — The International Chamber of Shipping (ICS) Bridge Procedures Guide (BPG)	Keep	100%	None
2.2 Communications between bridge and engine personnel	Keep	97%	None
2.3 Requirement to call the Master to the bridge	Keep	97%	None
2.4 Failure of bridge and engine room equipment	Keep	100%	None
2.5 Emergency situations at sea	Keep	100%	None
2.6 Introduction to Marine Engineering	Add	95%	This outcome will be added. It had originally been mislabelled as “Keep” on the original document but there was

			support for it's inclusion in the syllabus.
Outcome 3: Explain how to manoeuvre a vessel in a safe and controlled manner	Modernise	97%	Included the suggestion to use simulators to enhance this outcome and highlight Human Element Factors, where relevant
3.1 Factors which have an effect on manoeuvres, turning circles, and stopping distances	Keep	97%	None
3.2 Manoeuvring a vessel	Keep	89%	None
Outcomes for this competency, above and beyond STCW which would be needed due to use of modern technology and impact of future fuels onboard:			
How would you deliver this outcome/ objective?	How would you assess this outcome/ objective?	Action required	Consultation Support %
Ensure all outcomes are contextualised to help Cadets understand what they are learning in relation to what they will experience at sea.	While some outcomes are intrinsically linked to work carried out at sea, some need to be contextualised to show how they apply to work on board. Where this is the case, it is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and future seagoing technologies and practices.	Where outcomes do not specifically cover a topic which relates to work carried out at sea, more must be done to contextualise the outcome and make it relevant to the maritime industry, giving specific shipping examples of how the outcome may be applied in a modern shipping context. Not every template has contextualisation recommendations but please do add any you feel may have been missed.	100%
Include Human Element Factors throughout the syllabus	To provide seafarers with a contextualised understanding of the Human Element in the maritime industry, showing how they can put theory into practice in the work they carry out at sea.	Raise awareness throughout the Cadet's training of the areas in which human element factors will have an impact. Recommendations on where this can be included have been noted throughout the entire syllabus. Not every template	100%

		has Human Element Factor recommendations but please do add any you feel may have been missed.	
Include Data Science skills throughout the syllabus	Data Science Skills (Comprehension, Analysis, Presentation, etc...) are already required within much of the syllabus. A further, specific focus on these skills needs to be taught where relevant.	A specific topic will need to be introduced to improve Cadets' Data Science skills. Practical application of data science skills should be highlighted throughout the syllabus. Not every template has Data Science recommendations but please do add any you feel may have been missed.	92%

Marine Engineering - Mechanical Principles			
Outcome	Sub-Group 1.2 Recommended Action	Consultation Support %	Changes made as a result of industry feedback
Outcome 1: Analyse linear and angular motion within an engineering environment	Keep	100%	None
1.1 Displacement, velocity, speed and acceleration for linear motion.	Keep	100%	None
1.2 Distance time graphs for constant velocity, linear motion.	Keep	100%	None
1.3 Velocity time graphs for uniform acceleration, linear motion.	Keep	100%	None
1.4 Linear and angular velocity equations	Keep	100%	None
1.5 Relationship between linear and angular motion	Keep	100%	None
1.6 Inertia	Keep	100%	None
1.7 Momentum	Keep	100%	None
Outcome 2: Evaluate the forces and moments concerned with static equilibrium	Keep	100%	None
2.1 Resolution of forces	Keep	100%	None
2.2 Vector and scalar quantities	Keep	100%	None
2.3 Equilibrium, resultant and equilibrant	Keep	100%	None
2.4 Moments of a force	Keep	100%	None
2.5 Work, power and energy	Keep	100%	None
2.6 Friction	Keep	100%	None
2.7 Bodies on a horizontal plane	Keep	100%	None
Outcome 3 Evaluate the strength of materials in a range of engineering environments	Keep	100%	None
3.1 Stress and strain	Keep	100%	None

3.2 Modulus of elasticity	Keep	86%	None
3.3 Ultimate tensile stress and breaking stress	Keep	86%	None
3.4 Factor of safety	Keep	100%	None
3.5 Cantilever and simply supported beams	Keep	100%	None
3.6 Bending moment and shear force diagrams	Keep	100%	None
3.7 Bending moment equation	Keep	100%	None
3.8 Properties of a material	Keep	100%	None
Outcome 4: Analyse simple machines and their uses within a marine engineering environment	Keep	100%	None
4.1 Lifting machines	Keep	100%	None
4.2 Law of a machine	Keep	100%	None
4.3 Effort, load, velocity ratio, efficiency and mechanical advantage	Keep	100%	None
4.4 Simple and compound gear systems	Keep	100%	None
4.5 Vee belt power transmission	Keep	100%	None
Outcomes for this competency, above and beyond STCW which would be needed due to use of modern technology and impact of future fuels onboard:			
How would you deliver this outcome/ objective?	How would you assess this outcome/ objective?	Action required	Consultation Support %
Ensure all outcomes are contextualised to help Cadets understand what they are learning in relation to what they will experience at sea.	While some outcomes are intrinsically linked to work carried out at sea, some need to be contextualised to show how they apply to work on board. Where this is the case, it is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and	Where outcomes do not specifically cover a topic which relates to work carried out at sea, more must be done to contextualise the outcome and make it relevant to the maritime industry, giving specific shipping examples of how the outcome may be applied in a modern shipping context. Not every template has contextualisation recommendations but please	100%

	future seagoing technologies and practices.	do add any you feel may have been missed.	
Include Human Element Factors throughout the syllabus	To provide seafarers with a contextualised understanding of the Human Element in the maritime industry, showing how they can put theory into practice in the work they carry out at sea.	Raise awareness throughout the Cadet's training of the areas in which human element factors will have an impact. Recommendations on where this can be included have been noted throughout the entire syllabus. Not every template has Human Element Factor recommendations but please do add any you feel may have been missed.	86%
Include Data Science skills throughout the syllabus	Data Science Skills (Comprehension, Analysis, Presentation, etc...) are already required within much of the syllabus. A further, specific focus on these skills needs to be taught where relevant.	A specific topic will need to be introduced to improve Cadets' Data Science skills. Practical application of data science skills should be highlighted throughout the syllabus. Not every template has Data Science recommendations but please do add any you feel may have been missed.	86%

Marine Engineering - Auxiliary Systems			
Outcome	Sub-Group 1.2 Recommended Action	Consultation Support %	Changes made as a result of industry feedback
Outcome 1: Explain marine auxiliary equipment and system components.	Keep	100%	None
1.1 Layout of marine auxiliary systems	Modernise	100%	None
1.2 Types of marine auxiliary equipment	Modernise	100%	None
1.3 Operating principles of marine auxiliary equipment	Modernise	100%	None
1.4 Construction of marine auxiliary equipment	Modernise	86%	None
Outcome 2: Explain routine and emergency operational procedures for marine auxiliary systems.	Keep	86%	None
2.1 Starting and stopping of marine auxiliary systems	Modernise	100%	None
2.2 Routine and emergency operational procedures	Modernise	100%	None
2.3 Routine maintenance procedures	Modernise	100%	None
2.4 Routine testing of fire safety equipment	Keep	100%	None
2.5 Routine and emergency testing steering gear	Modernise	86%	Modern propulsion systems, such as azimuth thrusters, have been added.
2.6 Pollution prevention procedures	Modernise	100%	None
2.7 Paralleling of electrical generation plant	Keep	86%	None
Outcomes for this competency, above and beyond STCW which would be needed due to use of modern technology and impact of future fuels onboard:			
How would you deliver this outcome/ objective?	How would you assess this outcome/ objective?	Action required	Consultation Support %

<p>Ensure all outcomes are contextualised to help Cadets understand what they are learning in relation to what they will experience at sea.</p>	<p>While some outcomes are intrinsically linked to work carried out at sea, some need to be contextualised to show how they apply to work on board. Where this is the case, it is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and future seagoing technologies and practices.</p>	<p>Where outcomes do not specifically cover a topic which relates to work carried out at sea, more must be done to contextualise the outcome and make it relevant to the maritime industry, giving specific shipping examples of how the outcome may be applied in a modern shipping context. Not every template has contextualisation recommendations but please do add any you feel may have been missed.</p>	<p>100%</p>
<p>Include Human Element Factors throughout the syllabus</p>	<p>To provide seafarers with a contextualised understanding of the Human Element in the maritime industry, showing how they can put theory into practice in the work they carry out at sea.</p>	<p>Raise awareness throughout the Cadet's training of the areas in which human element factors will have an impact. Recommendations on where this can be included have been noted throughout the entire syllabus. Not every template has Human Element Factor recommendations but please do add any you feel may have been missed.</p>	<p>100%</p>
<p>Include Data Science skills throughout the syllabus</p>	<p>Data Science Skills (Comprehension, Analysis, Presentation, etc...) are already required within much of the syllabus. A further, specific focus on these skills needs to be taught where relevant.</p>	<p>A specific topic will need to be introduced to improve Cadets' Data Science skills. Practical application of data science skills should be highlighted throughout the syllabus. Not every template has Data Science recommendations but please do add any you feel may have been missed.</p>	<p>100%</p>

Deck - Marine Meteorology and Introduction			
Outcome	Sub-Group 1.2 Recommended Action	Consultation Support %	Changes made as a result of industry feedback
Outcome 1: Describe meteorological observing methods, use of meteorological instruments, use of world meteorological organisation (WMO) codes and weather services available to shipping.	Keep	96%	None
1.1 Meteorological instruments	Modernise	92%	None
1.2 Beaufort scale	Keep	96%	None
1.3 The organisation of the WMO	Keep	88%	None
1.4 Weather services available to shipping	Keep	100%	None
1.5 Non-instrument meteorological observations	Keep	96%	None
Outcome 2: Explain meteorological processes.	Keep	92%	None
2.1 Meteorological characteristics of the troposphere	Modernise	92%	None
2.2 Characteristics and causes of geostrophic and surface winds	Keep	96%	None
2.3 Processes of formation of cloud and precipitation	Keep	96%	None
2.4 Causes of reduced horizontal visibility	Keep	92%	None
Outcome 3: Identify and describe the weather associated with the main features of a synoptic chart.	Keep	92%	None
3.1 Surface charts	Keep	96%	None

3.2 Main synoptic patterns	Keep	100%	None
3.3 Air masses	Keep	100%	None
3.4 Weather associated with the main synoptic patterns	Keep	100%	None
Outcome 4: Describe the general circulation of the atmosphere, the main climatic zones over the oceans and the ocean currents of the world.	Keep	96%	None
4.1 General circulation of the atmosphere	Modernise	92%	None
4.2 Main climatic zones over the oceans	Modernise	100%	None
4.3 Ocean currents of the world	Modernise	81%	The positive use of currents for in weather routing has been added.
Outcomes for this competency, above and beyond STCW which would be needed due to use of modern technology and impact of future fuels onboard:			
How would you deliver this outcome/ objective?	How would you assess this outcome/ objective?	Action required	Consultation Support %
Ensure all outcomes are contextualised to help Cadets understand what they are learning in relation to what they will experience at sea.	While some outcomes are intrinsically linked to work carried out at sea, some need to be contextualised to show how they apply to work on board. Where this is the case, it is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and future seagoing technologies and practices.	Where outcomes do not specifically cover a topic which relates to work carried out at sea, more must be done to contextualise the outcome and make it relevant to the maritime industry, giving specific shipping examples of how the outcome may be applied in a modern shipping context. Not every template has contextualisation recommendations but please do add any you feel may have been missed.	96%

<p>Include Human Element Factors throughout the syllabus</p>	<p>To provide seafarers with a contextualised understanding of the Human Element in the maritime industry, showing how they can put theory into practice in the work they carry out at sea.</p>	<p>Raise awareness throughout the Cadet's training of the areas in which human element factors will have an impact. Recommendations on where this can be included have been noted throughout the entire syllabus. Not every template has Human Element Factor recommendations but please do add any you feel may have been missed.</p>	<p>100%</p>
<p>Include Data Science skills throughout the syllabus</p>	<p>Data Science Skills (Comprehension, Analysis, Presentation, etc...) are already required within much of the syllabus. A further, specific focus on these skills needs to be taught where relevant.</p>	<p>A specific topic will need to be introduced to improve Cadets' Data Science skills. Practical application of data science skills should be highlighted throughout the syllabus. Not every template has Data Science recommendations but please do add any you feel may have been missed.</p>	<p>92%</p>

Deck - Applied Marine Meteorology			
Outcome	Sub-Group 1.2 Recommended Action	Consultation Support %	Changes made as a result of industry feedback
Outcome 1: Analyse the major features of surface synoptic charts.	Modernise	89%	None
1.1 Major features of surface charts	Keep	94%	None
1.2 Development of surface pressure systems	Keep	94%	None
1.3 Movement of surface pressure systems	Keep	94%	None
1.4 Decay of surface pressure systems	Keep	94%	None
1.5 Weather conditions associated with types of surface pressure systems	Keep	94%	None
Outcome 2: Analyse the features of the major global climate zones.	Keep	94%	None
2.1 Major global climate zones (e.g., what happens at a low-pressure zone (equator)).	Keep	94%	None
2.2 Weather conditions associated with the major climate zones	Keep	94%	None
Outcome 3: Analyse surface oceanographic processes and data	Keep	94%	None
3.1 Oceanographic processes that drive surface ocean currents	Keep	94%	None
3.2 Oceanographic data	Keep	94%	None
3.3 Oceanographic conditions that may be encountered during a voyage	Keep	94%	None

Outcome 4: Evaluate the effect of meteorological and climatological processes on passage planning.	Keep	100%	None
4.1 Ocean weather routing of ships	Modernise	100%	Included the use of simulators to enhance training
4.2 Presentation of meteorological and climatological data	Keep	100%	None
4.3 Weather and sea conditions that may be encountered during a voyage	Modernise	100%	None
Outcomes for this competency, above and beyond STCW which would be needed due to use of modern technology and impact of future fuels onboard:			
How would you deliver this outcome/ objective?	How would you assess this outcome/ objective?	Action required	Consultation Support %
Modernise to include electronic resources	Electronic resources are regularly used at sea	Update to reflect that the weather reports are electronically sent to vessels. Should contain analysis of electronic weather reports and comparing with synoptic charts and actual weather conditions experienced by the vessel.	94%
Ensure all outcomes are contextualised to help Cadets understand what they are learning in relation to what they will experience at sea.	While some outcomes are intrinsically linked to work carried out at sea, some need to be contextualised to show how they apply to work on board. Where this is the case, it is important to make sure Cadets clearly understand how the outcome relates to work at sea and it is essential to make sure that this context is given with reference to current and future seagoing technologies and practices.	Where outcomes do not specifically cover a topic which relates to work carried out at sea, more must be done to contextualise the outcome and make it relevant to the maritime industry, giving specific shipping examples of how the outcome may be applied in a modern shipping context. Not every template has contextualisation recommendations but please do add any you feel may have been missed.	100%

<p>Include Human Element Factors throughout the syllabus</p>	<p>To provide seafarers with a contextualised understanding of the Human Element in the maritime industry, showing how they can put theory into practice in the work they carry out at sea.</p>	<p>Raise awareness throughout the Cadet's training of the areas in which human element factors will have an impact. Recommendations on where this can be included have been noted throughout the entire syllabus. Not every template has Human Element Factor recommendations but please do add any you feel may have been missed.</p>	<p>89%</p>
<p>Include Data Science skills throughout the syllabus</p>	<p>Data Science Skills (Comprehension, Analysis, Presentation, etc...) are already required within much of the syllabus. A further, specific focus on these skills needs to be taught where relevant.</p>	<p>A specific topic will need to be introduced to improve Cadets' Data Science skills. Practical application of data science skills should be highlighted throughout the syllabus. Not every template has Data Science recommendations but please do add any you feel may have been missed.</p>	<p>100%</p>



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