Proposal to modernise the Methodology of Teaching, Assessment/ Examination

ETO - STCW III / 6 CoC			
Competency/ Module: Marine Engineering: Electrical and Electronic Devices			
Knowledge, understanding and proficiency	**Recommendation of working group regarding the outcome and objective.**	**Rationale**	**Action required**
Outcome1: Explain the physical construction and the characteristics of electrical/electronic components	**Keep**	**Relevant**	**None**
1.1 Electrical charge, current, e.m.f., potential difference, electrical energy, and power	Remove	This is a duplication of outcome 1 of the DC/AC Principles module, it should all be covered within that module	Remove duplication here and cover the physical construction and characteristics within the DC/ AC Principles module
1.2 Resistance, inductance, and capacitance in terms of physical dimensions and materials	Keep	Relevant	None
1.3 Physical parameters of resistance, inductance, and capacitance	Keep	Relevant	None
1.4 Effects of temperature on conductors, semi-conductors, and insulators	Keep	Relevant	None
1.5 Temperature coefficient of resistance	Keep	Relevant	None

Outcome 2: Solve problems relating to linear d.c. and a.c. electrical circuits	**Keep**	**Relevant**	**None**
2.1 Series and parallel resistive d.c. circuits	Remove	This is a duplication of outcome 2 of the DC/AC Principles module, it should all be covered within that module	Remove duplication here and cover within the DC/ AC Principles module
2.2 Wheatstone Bridge	Keep	Relevant	None
2.3 A.C. sinusoidal waveforms	Keep	Relevant	None
2.4 Operation of circuits having R, L and C components	Remove	This is a duplication of outcome 2 of the DC/AC Principles module, it should all be covered within that module	Remove duplication here and cover within the DC/ AC Principles module
2.5 Shipboard electrical equipment	Keep	Relevant	None
Outcome 3: Explain the characteristics and marine applications of semiconductor devices used in rectification and small signal circuits	**Keep**	**Relevant**	**None**
3.1 Operations of p and n type diode	Remove	This is a duplication of outcome 1 of the Analogue Electronic Principles module, it should all be covered within that module	Remove duplication here and cover within the Analogue Electronic Principles module
3.2 Explain how rectification of an a.c. single phase supply is achieved using: one diode; two diodes and a centre tapped transformer; bridge rectifier	Keep	Relevant	None
3.3 Formation of a pnp and npn junction transistor	Keep	Relevant	None
3.4 Bipolar transistors as switches in marine applications	Keep	Relevant	None

3.5 Operation of small signal bipolar transistor amplifiers in marine applications	Keep	Relevant	None
3.6 Photo-electric effect	Keep	Relevant	None
Outcome 4: Explain Secondary Cells and Batteries for Marine applications	**Keep**	**Relevant**	**None**
4.1 Lead-acid and alkaline (Nickel cadmium) cells	Modernise	Insert modern battery technology. Lithium cells, Nickel metal hydride and LiFePO4 for example. This field will be increase in variety due to large amounts of research being carried out in battery technology.	Expand the list to include other battery technologies.
4.2 Charge/discharge graphs for both types	Keep	Relevant	None
4.3 Efficiency of batteries	Keep	Relevant	None
4.4 Batteries in series and parallel	Keep	Relevant	None
4.5 Charging circuits for batteries	Keep	Relevant	None
Proposal submitted by:	Any other outcomes for this competency, above and beyond STCW which would be needed due to use of modern technology and impact of future fuels onboard:		
	Objective	**Reason Why**	**Action required**

Proposal to modernise the Methodology of Teaching, Assessment/ Examination

Cadet Training and Modernisation Working Group	Raise awareness of safety hazards associated with the transportation of batteries within electric vehicles.	Electric cars have become more widespread, and this safety hazard will continue to grow.	Include an outcome called “Awareness of safety hazards associated with the transportation of batteries within electric vehicles.” In outcome 4. This should also be covered in Deck module “Marine Cargo Operations” and within the Advanced Firefighting short course.
Cadet Training & Modernisation Working Group	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.
Cadet Training & Modernisation Working Group	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.
Cadet Training & Modernisation Working Group	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.