|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course title** | Safe Use of Electrical Equipment | | | | |
| **STCW Code alignment ref.** | **Table A-III/7** Specification of minimum standard of competence for electro-technical rating |  | | | |
| **Function** | Marine Engineering at the support level | | | | |
| **Course code** |  | | **Directed learning hours** | **Lecture** |  |
| **Course version** | V1 | | **Tutorial** |  |
| **Level** | 4 | | **Blended** | 30 |
| **Credits** | 5 | |  |  |
| **Delivery mode** | Blended | |  |  |
| **Internet Based Learning Indicator** | 3 | | **Work integrated learning hours** | |  |
| **EFTS value** | .0417 | | **Independent learning hours** | | 20 |
| **Pre-requisites** |  | | **Notional learning hours** | | **50** |
| **Co-requisites** |  | | | | |
| **Attendance requirements** | 80% attendance is recommended for course work; | | | | |

**Aim**

Demonstrate knowledge and skills of the safe use and operation of electrical equipment

**Learning outcomes**

On successful completion of this course the student will be able to:

Outcome 1 **Follow safety instructions of electrical equipment and machinery**

* describes the transmission and distribution of electrical power
* describes the use and purpose of implementation of a "three phase-three wire, insulated neutral system" for shipboard application
* demonstrates basic knowledge of structure of electrical switchboards
* identifies safety precautions before commencing work or repair

Outcome 2 **Recognise and report electrical hazards and unsafe equipment**

* recognises safety hazards which can be present when working on shipboard electrical equipment: electric shock, arc blast, transient overvoltage, movable (rotating) parts, environmental factors like high temperature, humidity, water, fuel, steam leaks, rain, wind, ship rolling or pitching
* follows isolation and emergency procedures
* explains Lockout-Tagout procedures

Outcome 3 **Understand safe voltages for hand-held equipment**

* recognises causes of electric shock and precautions to be observed to prevent shock
* describes relationships between shock voltage and shock current
* recognises the possibility of the electric shock by the electrostatic charge
* explains the influence of shock current on human body
* recognises meaning of warning signs

Outcome 4 **Understand risks associated with high-voltage equipment and onboard work**

* explains the different voltages onboard and their risks
* explains the difference of electric shock caused by low and high voltage
* explains the basic parameters of electric arc: the temperature, the energy etc.
* demonstrates basic understanding of general High Voltage protection measures: housings, partitions, distances, insulation mats, insulation materials, access restrictions, markings and warnings, HV equipment access monitoring and locks

**Assessment**

|  |  |  |  |
| --- | --- | --- | --- |
| Number | Type | Weighting | Learning Outcomes assessed |
| 1 | Practical Assessment | C | 1, 2 |
| 2 | Project | C | 1-4 |
| 3 | Written test | C | 1-4 |

**Resources required**

Text books

Hall, Dennis T, 1996 Second Edition, Practical Marine Electrical Knowledge

ISBN 1 85609 1821

Hall, Dennis T, 2014 Third Edition, Practical Marine Electrical Knowledge

ISBN 978 1 85609 623 2

Schaum Theory and Problems of Basic Electricity

ISBN 0 03 025240 8

Videotel training video series

[Practical Marine Electrical Knowledge (1) - Ships Electrical Systems - Safety and Maintenance](mms://W2K8MEDIA.maritime.manukau.ac.nz/Ships%20Electrical%20Systems%20-%20Safety%20and%20Maintenance)

[Practical Marine Electrical Knowledge (2) - Electrical Distribution](mms://W2K8MEDIA.maritime.manukau.ac.nz/Electrical%20Distribution)

Laboratory

Electrical and Electronics laboratory – test instruments