|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course title** | Electrical Maintenance and Repair Procedures | | | |
| **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** | 65 |
| **Credits** | 8 | **Practical** |  |
| **Delivery mode** | Blended | **Workshop** |  |
| **Internet Based Learning Indicator** | 3 | **Work integrated learning hours** | |  |
| **EFTS value** | .0667 | **Independent learning hours** | | 15 |
| **Pre-requisites** |  | **Notional learning hours** | | **80** |
| **Co-requisites** |  | | | |
| **Attendance requirements** | 80% attendance is recommended for course work; | | | |

**Aim**

Demonstrate knowledge and skills of basic routine electrical maintenance and repair procedures of systems and machinery on board

**Learning outcomes**

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

Outcome 1 **Demonstrate knowledge of safety precautions to take prior to undertaking shipboard electrical maintenance and repair work**

* identifies 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
* names and is able to select proper Personal Protective Equipment (PPE) to be used when working on various shipboard electrical equipment: coveralls, safety or insulation shoes, safety glasses or full face shield, insulation gloves, insulation mats, hearing protection equipment, safety harness, hard hat, rubber apron, dust mask, flash suits
* knows about Lockout-Tagout procedures and safely isolates equipment and systems prior to electrical maintenance and repair work
* explains use of fixed and portable earthing devices and how to apply them safely
* knows safe electrical maintenance/repair work procedures for flammable areas
* is able to interpret and follow shipboard instructions relating to electrical maintenance and repair work
* interprets and follows electrical equipment/manufacturer safety guidelines for repair and maintenance work

Outcome 2 **Demonstrate knowledge of and interpret basic electrical drawings**

* interprets main features of ships electrical system technical drawings for maintenance and repair purposes
* interprets main features of ships electrical equipment drawings for maintenance and repair purposes
* identifies the symbols for electric generators, motors, transformers, contacts, switches, breakers, relays, time-delay relays, thermal relays, contactors, signal lights, fuses, measurement sensors and electric measuring devices, lighting fixtures, switches, sockets, connection boxes
* identifies the following diagram types:
  + block
  + system
  + circuit
  + wiring (connection)
  + view (layout)

Outcome 3 **Test for and detect basic faults and restore electrical equipment and machinery to operating condition**

* detects basic equipment/machinery electrical malfunction
* locates basic electrical faults
* takes action to prevent further damage due to a fault
* correctly uses measuring and calibration instruments during testing and restoration
* interprets and follows shipboard instructions and procedures for fault detection and system/equipment restoration

Outcome 4 **Demonstrate knowledge of the basic maintenance requirements of ships fire detection systems**

* interprets typical shipboard electrical fire detection system and maintenance documentation
* knows common fire detection testing procedures
* knows typical fire detection system electrical system preventative maintenance procedures

**Assessment**

|  |  |  |  |
| --- | --- | --- | --- |
| Number | Type | Weighting | Learning Outcomes assessed |
| 1 | Practical assessment | C | 1, 3 |
| 2 | Assignment | C | 1-4 |
| 3 | Short answer test | C | 2, 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