

## 1. MODULE DETAILS

<b>Module name</b>	<b>Lifting Techniques and Load Shifting</b>
<b>Nominal duration</b>	36 to 40 Hours. This duration includes the time taken to assess the module purpose but does not include necessary workplace experience and practice after initial training and before competence is determined.
<b>Module code</b>	NUL09
<b>Discipline code</b>	1003125

## 2. MODULE PURPOSE

This module provides knowledge and skills for lift/electrotechnology industry workers to safely and correctly carry out rigging procedures.

## 3. PRE-REQUISITES

These will be determined by the relevant state, territory or national authority responsible for OH&S in the industry.

## 4. RELATIONSHIP TO COMPETENCY STANDARDS

This module fully or partly addresses the underpinning knowledge/skills for the following National Lift Industry Units of Competency – 104, 105, 109, 110, 301, 306, 307 and 311; National Lift Industry Training Package, 1998; and the following National Electrotechnology Units of Competency UTE NES201b A and UTE NES401b A; National Electrotechnology Training Package, 1999.

## 5. CONTENT

**Interpret and explain the relevant legislative and safe working requirements which cover rigging operations in the workplace.**

**Determine mass and dimensions of given loads.**

**Determine minimum sling capacities for lifting equipment.**

**Obtain information from architectural and engineering drawings and plans.**

**Produce working freehand sketches from architectural and engineering drawings and**

**plans.**

**Discuss the characteristics and typical applications of rigging materials, tools and equipment.**

**Inspect rigging materials, tools and equipment for damage.**

**Repair and replace unserviceable rigging materials, tools and equipment.**

## **6. ASSESSMENT STRATEGY**

### **Assessment method**

- Short answer questions (written, oral or graphic or computer based).
- Suitable practical exercises which assess the skills required of the module purpose.

Assessment methods must assess all learning outcomes of this module to ensure that the requirements of the relevant regulatory authority are complied with.

### **Conditions of assessment**

Appropriate facilities for written tests and practical field observation.

Practical tasks should be conducted in the workplace or in a simulated workplace environment.

## **7. LEARNING OUTCOME DETAILS**

### **Learning outcome 1**

Interpret and explain the relevant legislative and safe working requirements which cover rigging operations in the workplace.

**Assessment criteria**

- 1.1 Identify and explain the relevant legislative and safe working requirements covering basic rigging operations in the workplace from:
  - Australian Standards
  - codes of practice
  - OH&S Act
  - plant regulations
  - manufacturers' specifications
  - site rules and procedures.
- 1.2 Explain the responsibilities and duties of a person carrying out rigging operations as described in the relevant legislation.
- 1.3 Explain the duty of care responsibilities as described in the OH&S Act 1985.

**Learning outcome 2**

Determine mass and dimensions of given loads.

**Assessment criteria**

- 2.1 Use the ISO Standard measurement terminology to describe dimensions of given loads (all dimensions to be given in metres and millimetres).
- 2.2 Interpret manufacturers' and suppliers' tables and charts to determine mass of given loads.
- 2.3 Use a tape measure, an electronic calculator and rules of calculation to determine the volume and mass of given geometric shapes. Calculated mass to be in tonnes and correct to the third decimal place. Load shapes to include:
  - square
  - circular
  - cylindrical (solid and hollow)
  - rectangular.
- 2.4 Interpret and use manufacturers' information to determine the mass of given loads

- 2.5 Interpret and use information from typical delivery dockets to determine the mass of given loads.
- 2.6 Calculate the total mass of given loads using the following methods:
  - number of units of materials
  - metre run of materials
  - surface area
  - volume.
- 2.7 Compare the estimated mass of given loads to the calculated mass of those loads to determine the validity of the calculated load mass.

**Learning outcome 3**

Determine minimum sling capacities for lifting equipment.

**Assessment criteria**

- 3.1 Examine, interpret, explain and apply without error the information displayed on safe working load tags.
- 3.2 Examine manufacturers' charts as provided, without error interpret and apply the information displayed on the chart to a specified range of loads, sling configurations and rigging applications.
- 3.3 Perform the required calculations to determine the following:
  - minimum capacity of sling required to raise a given load
  - maximum mass if load to be lifted with a given capacity sling
  - safe working load from known minimum breaking load.
- 3.4 All calculations to be performed without error, with the answer in tonnes correct to the third decimal place.

**Learning outcome 4**

Obtain information from architectural and engineering drawings and plans.

**Assessment criteria**

- 4.1 Identify without error, layout, and symbols from typical architectural and engineering plans and specifications.
- 4.2 Identify the types of projection used on a given number of plans that include one or more of the following projections:
  - 1st angle
  - 3rd angle
  - isometric
  - oblique
  - perspective
  - sectional.
- 4.3 Locate all structural elements and state without error their dimensional measurements from plans and specifications.
- 4.4 Identify without error:
  - all potential hazards
  - orientation of all buildings
  - all site access and exit points.
- 4.5 Determine and state correct dimensions and other information from plans and specifications.

**Learning outcome 5**

Produce working freehand sketches from architectural and engineering plans and drawings.

**Assessment criteria**

5.1 Produce legible working freehand sketches from given three dimensional structural elements / models.

Freehand sketches to:

- provide accurate information
- demonstrate clarity of information
- provide all relevant information.

**Learning outcome 6**

Discuss the characteristics and typical applications of rigging materials, tools and equipment.

**Assessment criteria**

6.1 Identify and state the name of all rigging materials, tools and equipment listed in the resource requirements of this module. Names of all items to comply with the Australian Standards and codes of practice or, where no identifiable standard exists, common industry usage.

6.2 Describe the uses given to rigging materials, tools and equipment as described in manufacturers' information and Australian Standards and codes of practice or, where no identifiable standard exists, appropriate industry usage.

6.3 Describe the limitations of given rigging materials, tools and equipment as described in manufacturers' information and Australian Standards and codes of practice or, where no identifiable standard exists, appropriate industry usage.

- 6.4 State or calculate without error the safe working load of all nominated appropriate materials, tools and equipment as described in manufacturers' information, load charts, Australian Standards and codes of practice and standard calculation rules.
- 6.5 Describe and demonstrate handling and storage techniques of nominated rigging materials, tools and equipment according to manufacturers' information and Australian Standards and codes of practice or, where no identifiable standard exists, appropriate industry techniques.

**Learning outcome 7**

Inspect rigging materials, tools and equipment for damage.

**Assessment criteria**

- 7.1 Inspect and classify, without error, all given rigging materials, tools and equipment to be either serviceable or defective according to manufacturers' standards and Australian Standards and codes of practice or, where no identifiable standard exists, appropriate industry standards.
- 7.2 Label and remove from service all defective unserviceable materials, tools and equipment.

**Learning outcome 8**

Repair and replace unserviceable rigging materials, tools and equipment.

**Assessment criteria**

- 8.1 Inspect given unserviceable rigging materials, tools and equipment, determine each item's condition according to manufacturers' standards, Australian Standards and codes of practice or, where no identifiable standard or information exists, appropriate industry standards.
- 8.2 Carry out minor repairs to given unserviceable materials, tools and equipment to restore each item to manufacturers' standards, Australian Standards and codes of practice or, where no identifiable standard exists, appropriate industry standards.
- 8.3 State the name and/or position of the authorised person to notify as to the need for replacement and disposal of materials, tools and equipment which cannot be repaired to the required standard on-site.
- 8.4 Complete inspection records by recording the necessary inspection details to comply with manufacturers' standards, Australian Standards and codes of practice, regulations of the relevant authority and enterprise standards.
- 8.5 Demonstrate safe practices in the inspection, handling and storage of rigging materials, tools and equipment, to manufacturers' standards, Australian Standards and codes of practice, regulations of the relevant authority and enterprise standards.

## 8. DELIVERY OF THE MODULE

### **Delivery strategy**

Delivery strategies must be suitable for both theoretical and/or practical learning and for the module purpose.

Delivery strategies should adequately address the content of all of the learning outcomes of this module to ensure that the requirements of the relevant regulatory authority are complied with.

It is recommended that learning and assessment be facilitated in a holistic manner which may require a learning sequence other than that indicated in the body of this module description.

### **Resource requirements**

Tools and equipment to be supplied by the training provider:

- slings
- ropes
- splicing tools and equipment
- shackles
- eye bolts
- wedge sockets
- wire rope grips
- thimbles
- clamps
- sheave bolts
- winches
- chain blocks
- chain pullers
- wire rope pullers
- spreader beams
- lifting beams
- equalising beams
- equalising gear
- swivels
- rigging screws
- turnbuckles
- jacks

- rollers
- skates
- skids
- sliding shoes
- feeler gauges
- fish plates and bolts
- packers
- chocks
- wedges
- cradle timbers
- barricades
- safety harnesses
- lanyards
- anchorage equipment
- fall arresters
- safety nets and static lines
- perimeter safety screens and shutters
- fastening devices
- tensioning devices
- ladders
- elevating work platforms
- personnel box
- levelling equipment
- hand tools, including: podger, adjustable spanners, drift, reamer, ring spanner, socket set, hammers, pinch bar and crow bar, torque wrench and drill bits
- portable power tools, including: variable speed drill, hammer drill, saw, impact wrench, single disc grinder
- air lines
- air compressor
- extension power leads
- portable hydraulic power packs and accessories.

Other resources to be supplied by the training provider:

- relevant Australian Standards and codes of practice
- manufacturers' information materials
- OH&S act and/or regulations
- model equipment and inspection records
- model enterprise standards.

**9. OCCUPATIONAL HEALTH AND SAFETY REQUIREMENTS**

Trainees should be made aware of Occupational Health and Safety issues in all situations.

Both trainees and trainers are expected to demonstrate safe working practices at all times.