

**1. Module details****Module name****Mains Layout: Surveying Techniques****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36 – 40 hours.

**Module code**

NUE233

**Discipline code**

0703130

**2. Module purpose**

This module provides knowledge and skills in basic surveying practices necessary to layout a mains design project correctly.

**3. Prerequisites**

NUE231 Mains Layout: Mapping and Planning.

**4. Relationship to competency standards**

This module addresses Units 4.2 and 4.3 of the E.S.I. National Competency Standards for Overhead Line Work and Cable Jointing.

**5. Content****Measuring heights and distances**measuring stick  
clinometer  
trundle wheel  
tapes  
correction for sloping ground  
distance across objects  
range rods**The compass**

taking bearings angles of deviation compass accuracy

**The clinometer**determining slopes  
clinometer accuracy**Recording information**

using a field book

**Plotting long spans**ground profiles from detail  
scaling  
selection of sag templates  
corrections for slope  
sag profiles as percentage of span  
vertical clearances**Pegging pole positions**

foot path alignments

types of pegs  
 pegs of other authorities  
 locating survey pegs  
 installing new pegs

**6. Assessment strategy**

**Assessment methods**

Short answer questions (written, oral or graphic or computer based).  
 Suitable practical exercises which assess the skills required of each learning outcome.

**Conditions of assessment**

Theory room for written tests together with practical field observation.  
 Learners must demonstrate competence in all learning outcomes to the standard described by the assessment criteria and perform all activities in a safe manner in accordance with State Occupational Health and Safety Acts and Regulations, Codes of Practice and Work Procedures when applicable.

**7. Learning outcome details**

**Learning outcome 1**

**Measure heights and distances.**

**Assessment criteria**

1.1 Complete an on site survey and record all relevant information for a design project including accurately recording distances and heights.

**Learning outcome 2**

**Use a compass.**

**Assessment criteria**

2.1 Take all appropriate bearings required for a mains design project at an on site location to industry standard accuracy.

**Learning outcome 3**

**Use a trigonometric clinometer.**

**Assessment criteria**

3.1 Take measurements that relate to a mains design project.

**Learning outcome 4**

**Use a field book to record survey information.**

**Assessment criteria**

4.1 Use a compass and clinometer to take relevant measurements for a mains design project to industry standard accuracy.  
 4.2 Record these measurements in a field book as per codes of practice and work instructions.

**Learning outcome 5**

**Plot long spans.**

**Assessment criteria**

- 5.1 Plot a ground profile from field book information to industry standard accuracy.
- 5.2 Draw a 75°C conductor sag profile curve for a long span of mains overlaid on the above ground profile. This drawing must be done by hand using the “percentage of span” method and to the requirements outlined in the codes of practice and work instructions.
- 5.3 From this data, the participant must determine the minimum ground clearance as stated in codes of practice, work instructions, mains design manuals and other relevant publications.

**Learning outcome 6**

**Peg pole positions.**

**Assessment criteria**

- 6.1 Peg a new pole position on site according to work instructions and drawings and codes of practice.

**8. Delivery of the module**

**Delivery strategy**

Delivery strategies must be suitable for both theoretical and/or practical learning and module purpose. It is recommended that learning and assessment be facilitated in a holistic manner which may require a learning sequence other than indicated in the body of this module descriptor.

**Resource requirements**

Enterprise construction manuals  
 Relevant Australian Standards  
 Enterprise work manuals and standing instructions  
 Acts and Regulations

**Occupational health and safety requirements**

Learners should be made aware of Occupational Health and Safety issues in all situations and be expected to demonstrate safe working practices at all times. Electrical safety must be emphasised.