



University of  
South Australia

Online

## UO STRUCTURES 1 - ASSESSMENT

|                     |   |
|---------------------|---|
| Assessment Name     | Assessment – Truss Design Report                            |
| Test Available from |   |
| Test Due            |   |
| Weighting           | % of the total grade for this course                        |
| File Type to submit | One *.doc or *.docx file, with a maximum file size of 100MB |

### TRUSS ANALYSIS AND DESIGN REPORT TEST COURSE OBJECTIVES:

It is beneficial to familiarise yourself with the relationship between the assessment and the course objectives.

- CO1: acting on structures and determine costs and use this to justify design decisions.
- CO2: support reactions, shear forces, bending moments and deflections.

### ASSESSMENT SUMMARY:

| COMPONENTS  | COURSE OBJECTIVES | WEIGHTING | DUE DATE | DETAILS | SUBMISSION PROCESS |
|-------------|-------------------|-----------|----------|---------|--------------------|
| 2 Questions | CO 1, 2           | %         |          |         | Online             |

### ASSESSMENT DESCRIPTION

In this test, please apply the relevant concepts covered in this course. In the first question, design different members of a truss. Where relevant, reference the relevant Australian Standard Loading Codes AS1170 and ASI Design Capacity Tables for Structural Steel.

Resources from weeks 1 - 10 will be a valuable reference.

## UO Structures 1 Test Instructions

### Read this page in detail

- The Test is out of 100 marks and is worth 35% of overall course grade
- Answer All Questions
- All Calculations must be typed, preferably using the Word Equation Editor. Handwritten calculations will not be assessed.
  - \* Preferably, type the calculations using equation editor in MS Word.
  - \*Excel spreadsheets and software analysis tools will not be accepted for submission.
- Word document submission only
  - Excel spreadsheets and software analysis tools will not be accepted for submission
- Where relevant, **diagrams must be included with calculations (e.g. Free body diagrams, tributary areas)** and these can be hand drawn and scanned in.
  - Clear and informative diagrams can help the assessor follow your calculations and reasoning.
- For **full marks** for any part of a question, working must be displayed and units must be correct at every step of working.
  - For example, in Question 1 Part A the correct support reactions with no working or free body diagram(s) to show how the support reactions were obtained, will only score 1 out of 10 for that part.
- The marks for each part are **underlined in bold font**
- Answers are to be correct to 2 decimal place.
  - For example, an answer of “The force in member YZ is 125.367 kN (Compression)” can be written as *The force in member YZ is 125.37 kN (Compression)*
  - For example, an answer of “The force in member YZ is 300.00 kN (Compression)” can be written as *The force in member YZ is 300 kN (Compression)*
- The [Design Properties and Capacity Tables](#) can be found in Course Information section and also in the **Assessment 2** Section on the Course website.
- You will need to access the Australian Standards, especially AS/NZS 1170.1:2002 via [Techstreet at the UniSA Library](#).

Student Name: Jamel Mann

Student Email: jmann@mymail.unisa.edu.au

**QUESTION 1:**

Calculate the axial force in member AB of the king post truss using the method of joints.

**QUESTION 2:**

Determine the support reactions at points A and E for the given truss loaded at joints.

**QUESTION 3:**

Using the method of sections, find the force in members CD, DE, and CE of the given roof truss.

**QUESTION 4:**

Explain the difference between zero-force members and redundant members in a statically determinate truss.

**QUESTION 5:**

A roof truss is subjected to a uniform distributed load of 5 kN/m. Determine the maximum tension and compression forces in any member.

**Parameter Table**

| Parameter                 | Value |
|---------------------------|-------|
| Span (m)                  | 12    |
| Height (m)                | 4     |
| Loan (kN/m)               | 9     |
| Top Chord Angle (degrees) | 37    |
| Material Grade (MPa)      | 316   |

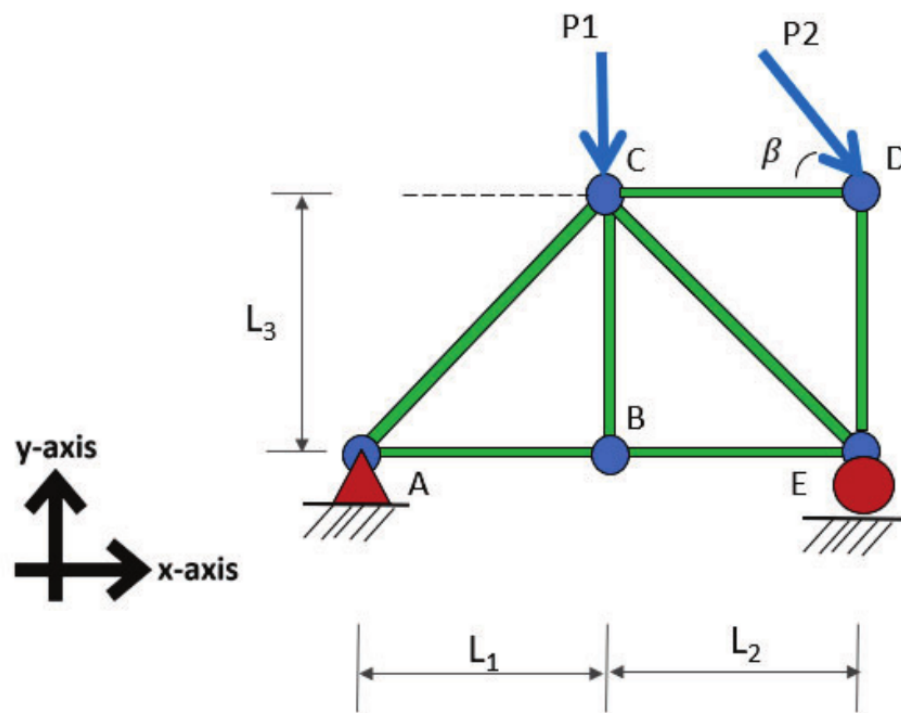


Figure 1: Steel Truss with bolted connections