



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
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- 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](#).

**QUESTION 1:**

This is a test Please determine the support reactions - 10 marks

**QUESTION 2:**

Please determine the force in the members AB and AC - 15 marks

**QUESTION 3:**

Design members AB and AC. What are the suitable cross section types for these members, you can select from the circular hollow section, square hollow section and equal angles? For zero-force members use SHS 65x65x1.6 - 12 marks

**QUESTION 4:**

Determine the stress, strain and elongation/shortening of members AB (Assume  $E = 200,000 \text{ MPa}$ ) - 8 marks

**QUESTION 5:**

Design the bolts for the connections on members AB and AC. Use the same "Grade:8.8" bolt size for all connections. That is, whatever bolt size is selected on one member, needs to be used on the other members. - 9 marks

**QUESTION 6:**

The steel price is \$25 per kg, and the bolt price is provided in Table 2. Determine the total cost of the material to build members AB and AC. - 6 marks