

Structures 1: Coursework Brief

Introduction

Understanding and interpreting how structures work in a conceptual way is at least as important as being able to analyse them mathematically and numerically. The designer of any structure makes decisions about materials, the form of the structure, how it is to be produced and so on. All these decisions have a major influence on how effective the structure is and how much it will cost.

Much of Structures 1 focuses on the (important) calculation side of things; by contrast this coursework element of the unit will focus on the equally important broader considerations. It will also require good communication of engineering ideas, a key ability for an effective engineer.

The Brief

In groups of four, identify, study and research the behaviour and design of an existing structure. Present your findings on a maximum of two sides of A4 or equivalent (e.g. 1 side of A3, or a short video or any other means of communication).

Notes:

1. Often text alone is a poor way of communicating engineering concepts. Sketches, pictures and other ways may be more effective.
2. Remember that the term “structure” can be interpreted broadly and could include spaceships, trees, car bumpers, skis, simple beams or many other items. For this piece of coursework, it may be more interesting to pick a slightly unusual type of structure.
3. The marks scheme (below) takes account of the range of information sources used. These should be cited clearly in your submission so suitable credit can be awarded.
4. Take advantage of this being group work. Argue, discuss, exchange ideas and so on before settling on a final structure and form of submission. Make sure work is divided appropriately between group members.

Marking

The following marks scheme will be adopted for the coursework. The coursework mark is worth 15% of the total course mark.

Mark	Description of a Typical Submission
70% or more	Shows significant insight into structural behaviour and design, either extending beyond the topics covered in lectures, or, if limited to those topics, applying them in novel ways. Sources of information are extensive and well-documented. Presentation is of a professional standard. Communication is very clear and shows imagination in using the limited space available.
60-69%	Shows good understanding of structural behaviour and design. Possibly some misunderstandings are present, or the depth of knowledge is limited. A varied range of information sources has been used. Presentation is generally clear and precise.
50-59%	Shows some understanding of structural behaviour and design but misconceptions or gaps in knowledge in key areas are also apparent. Information sources are sound but limited in scope. Communication merely adequate.
40-49%	Some basic understanding of structural behaviour is shown. Topic is not explored in any depth and information sources are limited. Little ability at engineering communication is shown.
30-39%	Very limited submission deficient in insight, evidence of research and evidence of understanding. Very poorly communicated.
29% or less	Submission of little or no value.

Some Useful Information Sources

The following provide some starting points for exploring and presenting the behaviour of structures. There are many others.

- expeditionworkshed.org
- [Structures or Why Things don't Fall Down](#), J.E Gordon, DaCapo Press 2003 2nd Ed.
- The air accident investigations branch
<http://www.aaib.gov.uk/publications/index.cfm>
- US government reports into the WTC collapses
http://www.nist.gov/el/disasterstudies/wtc/wtc_finalreports.cfm
- The library. Both for hard copies of things and electronic documents, for example the very useful [Construction Information Service](#) database)
- Walking around Manchester looking at structures with the notes from Structures 1 in mind!

Submission

Submit your work to B7 in George Begg in the usual way by 11pm on Friday 7th November.

Remember to put a cover sheet on with all the group members names!!

If you are submitting non-print media, such as a video or a website, either submit a CD containing your work, or submit a hardcopy of a web address where your work is located.