

Module Code **MM2MS2**
Module Title **Mechanics of Solids 2**
 Convenor(s) Dr Chris Bennett
 Year 2016
 Semester 1

General comments on the paper (these comments refer to the entire class and not individual students)

Students need to remember fundamental concepts from MS1 and apply them here. FBD technique and concepts such as equilibrium and compatibility remain important at this level. The MS2 topics build on those of MS1 and therefore students need a good grasp of that knowledge. It was evident that some students struggled with some of these fundamental concepts.

Question specific comments on the paper (these comments refer to the entire class and not individual students)

Comments on specific questions

Question Number	Comments
Question 1	Average mark: 75%; No. of students attempting question: 99%; Most students correctly determined the stress state on an element on the surface of the bar. Small errors were often made in the assignments of the stresses. On the whole most students remembered the procedure and equations for Mohr's circle but sometimes struggled with determining the correct values.
Question 2	Average mark: 38%; No. of students attempting question: 56%; Students struggled with this question despite similar examples being covered in the lectures. Fundamental errors were made in resolving forces (a) as compatibility was not considered.
Question 3:	Average mark: 57%; No. of students attempting question: 88%; Very mixed performance in the answering of this question. Multiple students achieved 25/25. The main problems in answering this question lies in the detail. If a small numerical mistake is made early on, this error carries all the way through the remainder of the question. This was the case for many students. Several marks were available for method applied but several calculations must be carried out correctly to get more than 20/25. Most common mistakes included the calculation of second moment of area, determination of the number of regions to split the cross section into and limits for each integration term.
Question 4:	Average mark: 60%; No. of students attempting question: 48%; Generally well attempted by those who did. The numerical section (part (c)) was answered extremely well in general, however the descriptive sections (parts (a) & (b)) were not answered with as much accuracy. The most common mistakes were leaving out much of the detail regarding the stages of crack growth due to fatigue and confusing the S-N with a fatigue stress vs. time plot.
Question 5:	Average mark: 60%; No. of students attempting question: 35%; A well answered question with most students able to construct the stiffness matrix of the elements. The methods of determining displacements and reaction forces were generally understood with some errors being made in these stages.
Question 6:	Average mark: 52%; No. of students attempting question: 87%; Students showed a poor understanding of the failure of ductile and brittle materials under torsional loading. A basic understanding of the physical representation of the Yield Criteria was shown in sections (b) and (c). Most struggled to convey the concepts of deviatoric and hydrostatic components. The calculation (part e) was generally well understood and executed, however errors were often made on the inclusion of the safety factor (missing completely or factoring the bending moment once it had been calculated)