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David McMurrey  
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Sterling Evans Library  
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**SUBJ:** Proposal to write a set of instructions for solving Engineering Mechanics 1 problems involving the internal effects of beams

Dear Mr. McMurrey:

I am a current student studying mechanical engineering here at Texas A&M University. Attached is a proposal to write a set of steps for solving a group of Engineering Mechanics 1 problems. I saw the need for this guide as a student enrolled in Engineering Mechanics 1. I believe this guide will aid students in their learning and help students after they have completed the class and need the information gained in this course.

The attached proposal outlines the need for and benefits of the guide, my plan, qualifications, and schedule for producing the guide, and the costs involved with writing the guide. An outline of the guide and the proposed sources of information are also included in the proposal. I see the guide as a benefit to many engineering students.

Please take time to review the attached proposal. Please feel free to contact me during business hours at 512-000-0000. I appreciate your time and consideration.

Sincerely,

Janice Bauhaus

Enclosures

# **Proposal: Guide to Solving Problems About the Internal Effects of Beams**

The following is a proposal to write a guide for solving Engineering Mechanics 1 (MEEN 212) problems involving the internal effects of beams. I just completed the course and saw the confusion and problems that arose when the class reached this section of the course. The report could be accessible to all students if it was placed in the Reserve section of the library. This report could help students enrolled in Engineering Mechanics 1 to learn faster and easier how to solve the internal effects problems. This proposal contains background information on the need for the guide, the benefits of having the guide, and my qualifications.

## **Need for a Guide to Solving the Problems**

Internal effects of beams are a major part of Engineering Mechanics 1. Students enrolled in the course tend to have difficulties solving the internal effects problems. Not all of the professors that are teaching the course have time to sit down and help each student. The schedule for the course does not permit more extensive coverage of this topic. Nor are the available textbooks helpful in this area.

## **Benefits of a Guide to Solving the Problems**

This guide would provide a reference for students who are having trouble. Having the guide accessible to all students would enable students who are encountering the material in classes after Engineering Mechanics 1 to have a reference to look to for help. Students sometimes need a different way to look at the material in order to grasp the concepts. This guide will provide a different outlook on solving the problems and will hopefully enable students to understand the material quicker. The last thing this guide will provide will be a additional examples for students to look at and to improve their comprehension.

## **Audience for the Guide**

The audience for the guide will be students enrolled in Engineering Mechanics 1. However, the guide will not just benefit students currently enrolled in the course, but also students who have completed the course. The guide will assume that its readers, engineering students, have completed prerequisite coursework leading up to Engineering Mechanics 1, but nothing beyond that. I will provide extensive discussion of concepts, examples illustrating those concepts, and extensive discussion of the examples. This amount of information should enable all but the most poorly prepared students to master.

## **Plan for Writing the Guide**

I plan to research some and use the notes and textbook from when I was enrolled in the class. In the guide I will include an explanation to solving all parts of the problems. I will provide detail and examples in each step to make the guide easier to understand. I will write the guide and have it bound and prepared to the specifications of the library. The guide could then be placed in the

library for all students to use. To notify students about the guide, I will talk to the professors teaching the course and ask that they either tell the students about the guide or let me come into their classes and make a short presentation to the class. The method used to inform the students would be totally up to the professors.

## **Graphics Included in the Guide**

The guide will have pictures of the various beams. The beams will have different forces on them throughout the length of the beam. The beams will also have two types of supports on them. The final solution of internal effects problems involve two graphs. Each problem that is solved will have at least one picture of the beam and two graphs as the solution.

## **Schedule for Writing the Guide**

The following is a tentative schedule for the guide:

<b>June 25</b>	Research ends
<b>July 20</b>	Rough draft turned in
<b>July 27</b>	Rough draft returned
<b>July 31</b>	Final draft sent to be copied and bound
<b>August 8</b>	Final bound copies given to the library

## **Qualifications to Write the Guide**

I am qualified to write the report because I have already taken the course. I received a high A in the course. I made a perfect score on every test taken in the course. Having been in the course, I know the problems that the students had with the course and what helped them to improve. I helped many students understand and solve the problems when I was in class with them and feel that I know what students taking the class now would need.

## **Costs Involved in Writing the Guide**

I do not anticipate many costs to be involved in writing the guide. I am not seeking a profit. The only costs I can see involved in preparing the document will be the costs of copying the document and binding the document. I don't see the need for more than two or three copies of the document. There are copiers available to the students if they would like their own copy. There are normally two or three copies of the documents in the Reserve in the library and it appears to work well. Therefore, I don't anticipate needing more copies.

## **Guide Outline**

- I. Introduction
  - A. Explanation of shear and bending moments
  - B. Explanation of the maximum moment
  - C. Discussion of when the problems are used in the job world

- II. Step 1: Find the reactions
  - A. Determine the type of supports used
  - B. Determine the strength of the forces at the supports
- III. Step 2: Find characteristic points on the beam
  - A. Determine the locations of forces on the beam
  - B. Determine the location of any moments on the beam
- IV. Step 3: Draw the shear force diagram
- V. Step 4: Draw the bending moment diagram
- VI. Step 5: Maximum moment
  - A. Determine the maximum moment exerted on the beam
  - B. Determine where the maximum moment occurs
- VII. Conclusion

### **Sources of Information**

1. Harris, Charles O. *Statics and Strength of Materials*. New York: John Wiley and Sons, 1982.
2. Jackson, John H. and Harold G. Wirtz. *Schaum's Outline of Theory and Problems of Statics and Strength of Materials*. New York: McGraw-Hill, 1983.
3. Kraige, L. G. and J. L. Meriam. *Engineering Mechanics: Statics*. 4th ed. New York: John Wiley and Sons, 1997.
4. Kokkinos, Filis T., Mechanical Engineering Professor. Texas A&M University. Notes given to class. College Station, TX. April 15, 1997.
5. Newman, Donald G. *Statics Exam File*. San Jose, CA: Engineering Press, 1985.