Instructions for the MEMS Lab Report

Your lab report should follow the format of the *IEEE Electron Device Letters*. The format from the IC Lab report will be used.

**Contents**: Your Letter should include the following sections:
- Title
- By-line (Author, affiliation, and submission date)
- Abstract (50–200 words)
- Introduction
- Experiment
- Results and Discussion
- Conclusion
- References

Although Letters do not usually have appendices, you should attach the following two appendices so the professors can better evaluate your work:
- Appendix A: Data
- Appendix B: Calculations

See the lecture slides “How to Write an IEEE Letter” for details about what should appear in each section and appendix. In addition, the lecture on Monday, October 27th will provide more details.

**Length**: Follow the guidance from the IC Lab Report on length.

Limiting the Letter’s length will be challenging. Use the following to focus your writing:

**Purpose**: The purpose of your Letter is to evaluate the mechanical properties of the low-stress silicon nitride structure you fabricated, and to discuss any differences between those properties and the properties predicted by the literature. The literature includes the paper by Sekimoto (on the course web site), and literature on mechanical properties (Modulus) of silicon nitride to be posted to the web site next week. YOU SHOULD FOLLOW THE GUIDANCE FROM THE OCTOBER 20th LECTURE TO DETERMINE THE TECHNICAL CONTENT TO BE INCLUDED.

**Audience**: You may assume that your audience is familiar with microelectronics.

**Grading**: For the MEMS Lab, you will receive a writing grade on your Letter and a technical grade based on your Letter and Appendices. The technical grade will be based on your critical evaluation of the material properties, and your comparison with the literature data. The first draft grade will be based on completeness:

- **3 points**: Complete. Acceptable as final draft.
- **2 points**: Significant work, but a section or figure is missing, or the writing quality is very rough.
- **1 point**: Multiple sections &/or graphs are missing or are merely outlined.
**Deadlines:** Multiple deadlines exist for this Letter, as listed below:

- **Wednesday, October 29th (in class):** Hand in a summary sheet with the data listed below. You will receive e-mail by Thursday morning indicating if the data looks OK. This is intended to provide feedback as to whether you are on the right track, and as such will not be graded.
- **Monday, November 3rd (e-mail):** Email **BEFORE CLASS** the completed Letter.
- **Wednesday, November 12th (in class):** You will receive feedback on the writing quality, and a partial grade.
- **Friday, November 21st (e-mail):** E-mail by 5PM your final Letter for final writing and technical grades. Appendices may be submitted the following Monday.

**Data required in summary for October 29th:**

For EVERY device tested by your group, provide:

- **DEVICE SIZE** (e.g. 5x50 Cantilever)
- **LOAD RANGE** (e.g. 0-200 microNewtons)
- **EXTRACTED MODULUS** (or an explanation of why it’s not possible to extract)

This should be no more than 1 paragraph or a table, e.g.;

<table>
<thead>
<tr>
<th>Device Size</th>
<th>Load Range</th>
<th>Modulus</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>5x50 Cantilever</td>
<td>0-2000 microNewtons</td>
<td>xxx GPa</td>
<td></td>
</tr>
<tr>
<td>5x100 Fixed-Fixed Bridge</td>
<td>0-100 microNewtons</td>
<td>N/A</td>
<td>Data too noisy</td>
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<td>........</td>
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<td>......</td>
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</tbody>
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