ECE418/ ECE518: Semiconductor Processing
Spring 2019
Report 1 Instructions
Due at the beginning of class Wednesday May 8th

Overview
This laboratory report is based on experimental work you have carried in the first three laboratory sessions (Weeks 3 and 4). This report requires you to communicate the procedure you have followed, analyze, present and interpret data relating to metal-oxide-semiconductor (MOS) capacitors.

The purpose of this report is primarily to improve your scientific communication and presentation skills, and to give you practice writing up experimental work in the form of peer-reviewed scientific papers. In particular, this exercise should give you the (sometimes challenging) experience of communicating a lot of information, clearly, in a relatively short space (here 4 pages maximum).

Please read this document fully before beginning, and adhere to the regulations listed below. Marks will be deducted if these regulations are not followed. I advise you to look at peer-reviewed journal articles (e.g. here) and attempt to follow their writing and presentation style as closely as possible.

You must write this report independently.

Report Regulations
Your report should adhere to the following specifications:

- Be between a minimum of 3 pages long, and a maximum of 4 pages long, including title, figures, captions etc., but not including references. If a report over 4 pages is received, only the first 4 pages will be considered.
- Be written in Times New Roman font, 11pt.
- 1.0 or 1.15 spaced lines.
- Single column.
- Have 1 inch / 2.54 cm margins.
- Be written in American English.
- Figures should be floating and have an appropriate caption and numbering scheme. Axes should be labeled clearly. Any text in figures should be legible without zooming (even if vector based).
- Equations should be numbered, with all parameters labeled appropriately.
- Please do not use Latex unless you are able to adhere to the above regulations.

Report Structure
The report should be broken up into the following sections:

1. Abstract. Here you should provide an overview of everything you have done. This should be a brief summary of everything contained in the report, condensed to no more than 200 words. It is best to leave this until last. It is ok (indeed expected) that you repeat here what you have written in other sections.
2. Introduction. Here you should give an overview of MOS capacitors, why they are of interest generally, why you are studying them.
3. Theory. A description of the operating mechanisms of MOS capacitors, operating regimes, and why CV curves appear the way they do. Lectures 5 and 6 will help you with this section.
4. Experimental. Clearly and succinctly describe the experimental processes you followed. The challenge here is to provide enough information to make it clear what you did, while being succinct and keeping the word number down. Use clear short sentences as used in scientific journal articles.
5. **Results and Discussion.** Present the experimental data you obtained clearly and logically. You will probably obtain more data than it is possible to present, so make intelligent choices as to what data is clearest / most representative of what you measured. Use of Excel graphing software is acceptable but ensure text is legible. Provide a clear and balanced assessment of the data and how you interpret it. Unexpected/unexplained results are normal, but should at least be accompanied by a conjecture on their origin.

6. **Conclusions.** A summary paragraph. This is similar to an abstract and should describe briefly the contents of the report. The conclusions paragraph differs from an abstract in that it is written in the past tense, and typically does not include any introduction / motivation: it focuses on only experimental procedures and results.

7. **References.** Not included in page limit. I suggest using a piece of reference management software such as Zotero (free) for this.

**Submission and Assessment**

Please hand in the laboratory report (printed physical copy) to John at the beginning of class on **Wednesday 8th May**. The graded paper will be returned to you in class on **Wednesday May 22nd**. It is acceptable to send me electronic copies via email, however any reports received after 4pm on Wednesday 8th May will be considered 1 day late.

There will be a total of **100 marks available**. You will be assessed based on the following criteria:

- Quality of scientific language and clarity of information delivery (20 marks).
- Demonstration of understanding of the topic (20 marks).
- Clear and accurate analysis of data (20 marks).
- Overall presentation (15 marks).
- Clarity and readability of Figures (15 marks).
- Appropriate use of references (10 marks).

Marks will be removed for not following the regulations as described above.

**Late reports will lose 10% of their overall mark per day late up to a maximum of 50%, after which they will receive a grade of 0%.**