Overview
This report is based on experimental work you have carried in the second set of laboratory sessions (roughly Weeks 5-8). This report will cover the fabrication and measurement of field-effect transistors.

Like the first report, the purpose of this report is primarily to improve your scientific communication and presentation skills. However, in this report you will additionally gain experience in collaborative writing. You will be expected to organize yourself as a group and distribute the workload between members. You will all be expected to edit and proof-read the text as a group.

You will write these reports in your assigned Laboratory Groups (as listed here).

Please read this document fully before beginning, and adhere to the regulations listed below. Marks will be deducted if these regulations are not followed.

Report Regulations
Your report should adhere to the following specifications:

- Be between 8 and 12 pages long, including title, figures, captions etc., but not including references or appendices. If a report over 12 pages is received, only the first 12 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 400 words.
2. Introduction. Here you should give an overview of field effect transistors, why they are of interest generally, why you are studying them.
3. Theory. A description of the operating mechanisms of NMOS field-effect transistors, and how they operate. Lectures 13 and 14 will be helpful sources of information on this subject.
4. Experimental. Clearly and succinctly describe the experimental processes you followed. You should also provide information of the measurement techniques you use to obtain data. The “Experimental” section should also contain any details of computational packages you have used. In your case this would be Athena / Atlas. If you calculate doping concentration using the Deal-and-Grove model for example, you should state the equations you use and provide a reference where they came from (textbook and/or lecture notes are ok).
5. **Results and Discussion.** Present the experimental and theoretical 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. If you see differences between calculated and theoretical data, provide some potential reasons for these discrepancies.

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. **Appendices.** Not included in page limit. Consider this to be similar to the supporting information of a journal article. This is where you should place your Athena / Atlas Code, or any other code you have used. You can also use the appendices to place additional graphs that you could not place in the main report. The appendices should not contain extended bodies of text: just descriptions of the figures placed within them.

8. **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) or email a soft copy to John by 4pm on **Wednesday June 12th**. Any reports received after 4pm on Wednesday June 12th will be considered 1 day late. Since the deadline is in finals week, you will not receive your report back, however you will be emailed a summary sheet with marks allocated as below:

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 (15 marks).
- Ability to apply and understand theoretical models (15 marks).
- Clear and accurate analysis of data (15 marks).
- Overall presentation (15 marks).
- Clarity and readability of Figures (15 marks).
- Appropriate use of references (5 marks).

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

Since this is a group report, you will have the opportunity to provide feedback on your colleagues. This is optional, and if you feel all your colleagues provided an adequate contribution, you do not need to provide feedback.

**Late reports will lose 20% of their overall mark per day late up to a maximum of 40%. Any reports received after 4pm on Friday June 14th will receive a grade of 0%.**