Final Project:
Due May 13, 2016 (Friday)
at Prof. Wu's office, 511 Sutardja Dai Hall

Scope:

The Final Project is intended as a comprehensive exercise of what you learned in this course. You will analyze an optoelectronic device of your choice, using the techniques and tools covered in this course. Some sample topics are listed below, but you are free to choose your own topics, or create your own device with appropriate assumptions.

Requirements of the topic:

- It includes an optoelectronic component such as semiconductor lasers, LEDs, modulators, photodetectors.

- It includes optical design using Lumerical, e.g., to calculate optical quality factor (Q), threshold condition, quantum efficiency, loss, etc.

- You don't necessarily need to invent a new device. You can analyze structures published in the literature. You can make reasonable assumptions to simplify the device so it can be analyzed within the scope of this course. Your results may not be identical to the paper you are following. In this case, include a discussion on where you think the differences come from.

Deliverables:

- A 3 to 4-page report using Optics Express template: https://www.osapublishing.org/oe/submit/templates/ (or other technical journal format that you are already familiar with).

- The report should include
    1. A short introduction describing why you picked your device, what you plan to analyze, and the method you used
    2. Problem formulation
    3. Analysis
    4. Key results
    5. Conclusions
    6. References

- Include your Lumerical code as appendix.

Sample Topics:

- Submicron microdisk laser
- Hybrid Si laser
- Germanium laser or Ge-Tin laser
- Laterally injected photonic crystal laser
- Plasmonic (metal optics) laser