# PHY 1033C: Discovering Physics Fall 2013 Professor Mark W. Meisel

**“*in vivo*”** schedule (**black text: projected and tentative**; **purple text: past**; **blue text: hotlinks**;

**red text important announcements**; **green text: fixed final exam**)

**Note:** Schedule is “projection” and revisions will be announced in class and subsequently posted online.

Week 1 Aug 20 No Class.

Aug 22 Class Starts, Introduction to the Course.

**Textbook Reading for next class:** Section 2.6.

**Lab Prep Reading for next class:** [Pinhole Physics Lab 1](http://www.phys.ufl.edu/~meisel/Pinhole-Physics-Lab1.pdf).

**Explanation about** [“Observing Assignment”](http://www.phys.ufl.edu/~meisel/PHY1033C-Observing-Assignment.doc).

Week 2 Aug 27 [Pinhole Physics Lab 1](http://www.phys.ufl.edu/~meisel/Pinhole-Physics-Lab1.pdf) and Section 2.6 in textbook.

**Textbook Reading for next class:** Chapter 1.

HITT will be “practice”; points not kept this day.

Aug 29 Debriefing of [Pinhole Physics Lab 1](http://www.phys.ufl.edu/~meisel/Pinhole-Physics-Lab1.pdf) and Chapter 1.

**Lab Prep Reading for next class:** [Reflections and Images Lab 2](http://www.phys.ufl.edu/~meisel/Reflections-Images.pdf).

**HITT will be “live” on this day and all others; points kept!**

Week 3 Sep 03 [Reflections and Images Lab 2](http://www.phys.ufl.edu/~meisel/Reflections-Images.pdf).

**Textbook Reading for next class:** Chapter 2.

Sep 05 Debriefing of [Reflections and Images Lab 2](http://www.phys.ufl.edu/~meisel/Reflections-Images.pdf).

Discussion of Newton’s Particle Theory of Light (Chapter 2).

**HITT Question on Chapter 1.**

**Textbook Reading for next class:** Chapter 3.

**Bring Sunglasses with you for next class.**

**Lab Prep Reading for next class:** [Refraction Lab 3](http://www.phys.ufl.edu/~meisel/Refraction.pdf).

Week 4 Sep 10 [Refraction Lab 3](http://www.phys.ufl.edu/~meisel/Refraction.pdf).

**Assignment for Sep 17:** “Making Models”.

Particle vs. Wave Nature of Light: Discussion.

Waves and wave nature of light: “Discovery” activities.

[Acoustics and Vibration Animations - Dan Russell, Grad. Prog. Acoustics, Penn State](http://www.acs.psu.edu/drussell/demos.html)

“Discovery” Lab Activity with polarization (bring sunglasses) and waves.

**Textbook Reading for next class:** Chapter 4.

Sep 12 Debriefing of [Refraction Lab 3](http://www.phys.ufl.edu/~meisel/Refraction.pdf). and continue discussion of Sep 10.

**Lab Prep Reading for next class:**

[Measurement of Wavelengths of Light Lab 4](http://www.phys.ufl.edu/~meisel/Wavelengths-Lab4.pdf).

**Textbook Reading for next class:** Chapter 4.

**Assignment for Sep 17:** “Making Models”.

Week 5 Sep 17 **Due by NOON:** “Making Models”. Submit to Turnitin.com.

Worth 3 points.

Comment on your impression of “Making Models”.

Is this process applicable to your own field of study?

What is your field of study?

Requirements: 1 page. 1 in all margins. 12 pt “standard” font.

Line spacing of 1.5 lines.

[Measurement of Wavelengths of Light Lab 4](http://www.phys.ufl.edu/~meisel/Wavelengths-Lab4.pdf).

Sep 19 Review [Measurement of Wavelengths of Light Lab 4](http://www.phys.ufl.edu/~meisel/Wavelengths-Lab4.pdf) and Reading in Ch. 4.

**Textbook Reading for next class:** Chapter 5 Sections 5.1 and 5.2.

**Lab Prep Reading for next class:** [Electrostatics Lab 5](http://www.phys.ufl.edu/~meisel/PHY1033C-Electrostatics-Lab5.pdf) and the [Amazing Pie Plate](http://www.phys.ufl.edu/~meisel/PHY1033C-Pie-Plate.pdf).

Week 6 Sep 24 [Electrostatics Lab 5](http://www.phys.ufl.edu/~meisel/PHY1033C-Electrostatics-Lab5.pdf) and the [Amazing Pie Plate](http://www.phys.ufl.edu/~meisel/PHY1033C-Pie-Plate.pdf).

**Textbook Reading for next class:** Chapter 5 Sections 5.3 and 5.4.

**Additional Reading for next class:** “Boxed In”, Adrian Cho, *Science* 341

(2013) 1056-1059 and “The Standard Models” graphic on p 1059 is required.

<http://www.sciencemag.org/content/341/6150/1056/F3.expansion.html>

Sep 26 Review Electrostatics, Magnetostatics, and Ch. 5 Sections 5.1 to 5.4.

Week 7 Oct 01 “Problem solving Lab Day”, work problems in small groups.

“The Problems” are available at:

<http://www.phys.ufl.edu/~meisel/PHY1033CFall2012-Problem-Lab.pdf>

Oct 03 Review for Mid-Term Exam, Come prepared to ask Questions.

Week 8 Oct 08 **Mid-Term Exam (50 points): Textbook Ch. 1 to Ch. 5 Section 5.4**

**and all material from labs and lectures.**

Oct 10 **Observing “Day”: No formal class meeting:** [“Observing Assignment”](http://www.phys.ufl.edu/~meisel/PHY1033C-Observing-Assignment.doc)

**Textbook Reading for next class:** Chapter 5 Sections 5.3 to 5.4.

**Lab Prep Reading for next class:** [Magnetic Fields Lab 6](http://www.phys.ufl.edu/~meisel/PHY1033C-Magnetic-Fields-Lab.pdf).

Week 9 Oct 15 [Magnetic Fields Lab 6](http://www.phys.ufl.edu/~meisel/PHY1033C-Magnetic-Fields-Lab.pdf).

Oct 17 Review Test Results, Chapter 5 (partial) discussion.

**Reading Assignment: Finish Chapter 5.**

Week 10 Oct 22 [Magnetic Fields Lab 6](http://www.phys.ufl.edu/~meisel/PHY1033C-Magnetic-Fields-Lab.pdf) more time to finish and revise as needed.

Oct 24 Recap of Lab 6 and Chapter 5 discussion

**Reading Assignment: Chapter 6.**

Week 11 Oct 29 Visit to Meisel Lab: NPB B133 and Microkelvin Lab. Meet in classroom.

**Reading Assignment: Chapter 6.**

Oct. 31 Debriefing on Lab exercises and visits. Discussion of Chapter 6.

**Prepare for “Motor” Lab!**

Week 12 Nov 05 **“Motor” Lab (Part 1)!** You will make your own motor, and then describe

how it works within the context of the material that we have covered in

lectures, in lab activities, and in readings.

<http://www.youtube.com/watch?v=it_Z7NdKgmY>

<http://sci-toys.com/scitoys/scitoys/electro/electro.html#motor>

<http://hilaroad.com/camp/projects/magnet.html>

**Reading Assignment: “Light and Life” by Niels Bohr,**

*Nature* 131, 421-423 (25 March 1933), read full text in PDF (right column)

<http://www.nature.com/nature/journal/v131/n3308/abs/131421a0.html>

Nov 07 Debriefing of “Motor” Lab (Part 1). Preamble for Chapter 7.

**Reading Assignment: Chapter 7.**

Week 13 Nov 12 **Viewing Assignment:**

***TED Talk:*** “Ramesh Raskar: Imaging at a trillion frames per second”

(filmed June 2012 and posted July 2012), see:

<http://www.ted.com/talks/ramesh_raskar_a_camera_that_takes_one_trillion_frames_per_second.html>

“Motor” Lab (Part 2).

**Reading Assignment:** Chapter 7.

**Reading Assignment:** “Quantum Procrastination” by Seth Lloyd,

*Science* 2 November 2012: Vol. 338 no. 6107 pp. 621-622

(<http://www.sciencemag.org/content/338/6107/621.full>)

Nov 14 Discussion and Review of Chapter 7. **Reading Assignment:** Chapter 8 and 9.

**FRIDAY Nov. 15**  “Starry Night Expo” at FLMNH (Florida Museum of Natural History)

**LAST CHANCE** for “Observing Assignment” and meet Space Biologists!

Week 14 Nov 19 Problem Solving Lab 2 Session.

<http://www.phys.ufl.edu/~meisel/Problem%20Solving%20Lab%202.pdf>

**Textbook Reading for next class: Chapter 8 and 9.**

Nov 21 **Special Relativity: The Basics.**

**Nov 26** **Course Evaluations**, “GatorRater” (?), <https://evaluations.ufl.edu/evals/>

**to** open now and until last day of classes.

**Dec 06**  **Extra Credit** of 5 pts to everyone in class if more than 80% of the students respond.

Week 15 Nov 26 **Reading Assignment: Chapter 8 and 9. Reading, Writing, and**

**Observing “Day”: No formal class meeting:** [“Observing Assignment”](http://www.phys.ufl.edu/~meisel/PHY1033C-Observing-Assignment.doc).

Nov 28 **No Class: Thanksgiving Holiday.**

Week 16 Dec 03 Last Day of Class. Review of Problem Solving Lab Session and Course.

[“Observing Assignment”](http://www.phys.ufl.edu/~meisel/PHY1033C-Observing-Assignment.doc) **Due by 3 pm to Turnitin.com (15 points).**

Dec 05 **No Class: Reading/Review Break.**

**Office Hours during Exam Week:**

By appointment, contact Instructor by email to arrange.

Final Exam (Group 12A): Thursday, 12 December, 07:30 am to 09:30 am, Larsen Hall 310 ([LAR 310](https://classrooms.at.ufl.edu/classroom-info/pictures-and-info/#prettyPhoto[LAR]/1/)), [campus map](http://campusmap.ufl.edu/) (if you need it). Final Exam covers material from the entire course.