

## ICB Math/Physics Tutorials - MTH 1110, SCI 1110, Section 2

<http://projects.olin.edu/ICB-2/>

Course Info Sheet – Fall 2007

### Instructor Information:

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Meeting Times/Location: W 9:00 – 10:50 am, 1-2:50 pm AC 213

Office Hours: TBA

Course Assistants: Bryce Lee (Mathematics) and Eric Hwang (Physics)

This portion of the ICB is dedicated to ensuring that you know all of the calculus and mechanics that you need to support your work in studio, in ECS, in Design Nature, and in your future courses here at Olin and beyond. It also introduces you to some of the fun and wonder that are inherent in mathematics and physics – two disciplines that are beautiful in their own right! You will work on your group-learning skills while also finding out about your own individual learning style.

### Learning Objectives/Measurable Outcomes:

The math/physics tutorials and accompanying studios work together to develop and strengthen disciplinary concepts and skills in mathematics and physics; to introduce students to important concepts in modeling and simulation; and to provide students with opportunities to practice and develop interdisciplinary competencies including teamwork, communication, and the posing and testing of hypothesis.

In the math/physics tutorials, the major disciplinary objectives are as follows:

1. Identify relevant physical parameters and equations to solve a given physical problem.
2. Set-up appropriate equations to solve a given physical problem.
3. Appreciate and understand the mathematics present in these equations.
4. Solve mathematical problems related to integration, differentiation, sequences, series, introductory vectors and vector-valued functions, and introductory differential/difference equations.
5. Verify answers through order of magnitude calculations, estimates, and checking of fundamental physical principles.
6. Communicate solutions in neat, clear written form.

### Competencies Assessed:

1. **Quantitative Analysis** (Analyze and mathematically solve a variety of problems, including problems with numerical answers and problems requiring proofs.)
2. **Communication** (Develop technical writing skills through writing solutions to problems on homework, quizzes, and tests.)

Competencies will be assessed at the “beginning level.” Other competencies that will be developed include **qualitative analysis** and **teamwork**.

**Texts:**

Wolfson and Pasachoff. *Physics with Modern Physics for Scientists and Engineers*. 3<sup>rd</sup> Edition. Addison-Wesley, 1999.

(Updated!) James Stewart. *Calculus, early transcendentals single variable*. 5<sup>th</sup> Edition. Brooks-Cole, 2003. ISBN: 0-534-39330-6.

**Attendance:**

Class meetings are the most important part of the tutorial aspect of the ICB. Sometimes, we will cover material in your book, but with different examples or applications. Sometimes we will cover material not covered in your book. Often you will be working problems at your desks or at the boards. Usually you will be handing in homework. We expect you to be there to participate and engage in conversation with your peers and with us! We value your participation in class so much that it will count towards your final grade.

Also, note that we will have a quiz every week, rotating between math quizzes and physics quizzes. These will be given during the first 15 minutes of the appropriate class. Make-up quizzes are not possible unless there is a real emergency (in which case you need to talk to OSL).

**Homework:** The homeworks will consist of two types of problems:

- **Pre-class Reading Problems:** Two or three problems at the beginning of each assignment will be ‘reading’ problems. These are problems on the material that is going to be presented at the next class. You should have read the assigned material and completed these problems before the class covering this material. These problems will help prepare you for a more interactive class, and they will help you become good at learning material independently.
- **Enrichment problems:** The remaining two or three problems on each homework assignment will be more difficult problems which you should do after the class on the material. These are meant to be more challenging and make you think. Don’t give up on them if you can’t see how to do them immediately! These problems may take some time, and you may find that coming to office hours helps you complete these problems.

**Using resources on Homework:**

Before using any resources (including classmates) on homework, you should always try each problem on your own. This will help you understand your own strengths and weaknesses so that you can work appropriately with your professors to prepare for the exams.

The following are **strictly forbidden**: You may not use the Instructor’s Solutions Manual, you may not use past students’ work, and you may not use any other source of solutions (from other schools, on the web, etc).

Any other resources are permitted under the following two conditions:

- You must never simply copy a solution or hand in a solution that you do not fully understand. By handing in a solution, you are certifying that you understand it completely and you can independently solve similar problems.

- You must **always cite** your source of help next to each problem. Simple notes like “checked answers with Luisa,” “used back of book,” “used book CD,” “used book website,” “used Book A by Author B,” “helped by Jenny” are perfectly fine. Feel free to use obvious abbreviations – I don’t want citing to be a time burden. Getting in the habit of always citing sources of help is good professional practice and it is in the spirit of learning and the Honor Code.

If you do not use any sources or receive any help from friends, then please write “No Help” on the top of your paper.

If you have any questions about what resources are allowed or how to cite them, please just ask!

**Other requirements HW:**

It is essential that all turned-in homework be neatly written or typed. On the upper right hand corner of the first page, please list your full name, the class and section (ICB-2), the assignment (e.g. “HW #1, Math Tutorial”) and the due date for the assignment. You must staple all pages together. Each problem must be clearly labeled (e.g. Ch 5.4, #23), and final answers (if applicable) should be circled. You must show your work, which means that steps must be clearly explained. Neatness and clarity of explanation are essential; your exposition will be evaluated.

*No late homework will be accepted unless there is a real emergency. Please do not ask for an exception. Emergencies should be handled through OSL.*

**Quizzes:**

To check comprehension and help prepare you for the exams, math and physics will each hold short 15 minute quizzes every other week. These will alternate weeks between math and physics to help you stay on top of your work in both areas.

**Exams:**

You will have two exams: a midterm and a final. These exams will be administered jointly between math and physics, including some great interdisciplinary problems.

**Grades:**

To achieve a passing score for either MTH 1110 or SCI 1110, you must receive both a passing score for the relevant tutorial based on the percentages below, AND you must receive a passing score in the studio component.

Participation/Engagement: 5%

Quizzes: 20%

Homework: 25%

Tests: 50%

**Laptops:**

We will sometimes want you to have your laptops in class. Please refrain from talking on IM, doing email, or doing unrelated web surfing during class, as this is distracting to both us and your fellow students. If you are that bored, please talk to us about it! We will find a solution.

**Office Hours:**

Please come to office hours with questions big or small! Or maybe you don't even know what your questions are; we can probably still help. Sometimes a few minutes in office hours can make a big difference. If you need a special appointment, please ask.

**Daily Schedule:**

The schedule and all assignments are subject to change as we go. Check the calendar every day! <http://projects.olin.edu/ICB-2/Calendar.htm>

**Honor Code:**

All professors at Olin regard the Honor Code as essential to the academic integrity of the college. Please express any concerns in a timely fashion.