

Three Rivers Community College
PHO 290 Advanced Laser Topics
3 Credits

Prerequisites: PHO 240 (Introduction to Lasers) This means you will also have taken two semesters of optics and math through at least Precalculus. You should also have taken at least one EET course.

Course Objectives and Method

You have studied many topics in optics and have had an introduction to laser physics and technology. Many of the topics you've seen probably seem to be unrelated to each other and you may not have a good idea of how (or if) they relate to current technology. The goal of Advanced Laser Topics is to fill in some of the missing information and to give you an idea of how what you've learned is related to modern optics/photonics technology. This goal will be accomplished through a combination of classroom lectures, reading (current journals, web sites or company literature), guest speakers from industry and company visits. You will also perform some laboratory investigations, also scheduled for the class time, and a mini-project of at least 3 weeks duration.

Required Text: None. However, there will be extensive use of handouts so you will need a binder to keep them in order. You will also keep an online journal at WebCT where you will do pre-labs and respond to questions about trips and speakers (more on this later in the course.)

Attendance Policy

Since there is no textbook for this course, it is absolutely essential that you attend every class. If you must miss a class, you will have to ask a classmate for notes. If there is a weather advisory and it is not clear if class will be held, call my office phone (885-2353) after 7:30 AM on the day of the class to find out if I will be in.

Topics

Because the course aims to keep up with the state of the art, topics vary from year to year. For Spring 2008, the topics will tentatively include:

- Laser testing (PBL challenge)
- The elements of a DWDM system.
 - Use of the optical spectrum analyzer to study DFB laser operation and characteristics
 - Erbium doped fiber amplifier (EDFA) characteristics
 - Creation a model WDM system from components
- Fiber lasers (trip to IPG photonics)
- Specialty fiber manufacture and test (trip to OFS)
- Laser Manufacturing
- Automation/machine vision- team projects

Assessment Policy

The grade for this course will be based on your written reports on the course activities-labs, field trips, projects, occasional homework and pre-lab questions. Some of the labs will have more formal reports, others will require only a one-page summary.

Field trips are a very important part of this class, since they are your opportunity to see how optics is currently applied in industry and to look at some of the places you may be working. You will be expected to attend all field trips specifically scheduled for this course. These will be scheduled during class time. Understanding that travel will make the field trips take longer than a class (up to 4 hours), you may miss one field trip with permission, and an alternate assignment will be provided.

Approximate grade breakdown:

Lab and project reports: 50%

Other reports, homework, prelabs: 50%