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, laboratory investigations and a multi-week project of your choice.

Required Text: None. However, there will be extensive use of handouts so you will need a binder to keep them in order. You will need a bound laboratory notebook to record notes, ideas, data- everything you do in this course. Here is a resource for keeping a laboratory notebook: http://www.ruf.rice.edu/~bioslabs/tools/notebook/notebook.html

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. The lab will be open extended hours so you will have time to work on your project. (Details TBD)

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 2009, the topics will tentatively include:

- The elements of a DWDM system. You will study the components that make up the system (DFB lasers, multiplexers and demultiplexers, circulators, filters, etc). You will also perform several laboratory investigations, including some or all of:
    - 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
- Project: we have a great deal of new equipment and much of it can provide ideas for student projects, including fiber laser characterization, using a Fabry Perot interferometer and machine vision.

Assessment Policy

The grade for this course will be based on your written reports on course activities including lab exercises, field trips, homework etc. Your project will be presented through a paper and a poster, to be displayed to other students and industry representatives. You will be graded on the paper, poster and your use of the laboratory notebook. The project will also require weekly progress reports, which will be considered homework. Format will be discussed in class.

Approximate grade breakdown:

Lab reports and homework: 50%

Project and final presentation and paper: 50%