Broadband Optical Networks
Project Suggestions, Guidelines and Requirements

1. You can either select one topic from the list or choose a topic related to optical networks (system or components issues). You need to submit a one-page proposal on or before March 6. I prefer each student choosing a different topic. Therefore, you need to talk to me before you decide upon a topic.

2. The project has two parts: 1) report (20% of course grade) and 2) oral presentation (10% of course grade). A progress report should be submitted on April 10. On May 1, the first draft of the final report will be due. I will return your drafts and the final draft will be due on May 18 noon. The oral presentation will be scheduled on May 8 and 10.

3. The length of the oral presentation should be about 15 min. which includes 3 min for discussion. We will stick to the time limit for presentation.

4. The length of the manuscript including illustrations should be about 5-6 pages long for undergraduate students and 10-12 pages long for graduate students. The style should conform to the style guide in this handout. You should be able to find a MS word template for style on "scylla.ceas.uwm.edu/465".

5. List of references should be collected at the end of the paper. Figures should be properly explained in the text and in the figure captions. Check journals such as Optics Letters and IEEE Photonics Technology Letters to get a feeling on this requirement.

6. The paper and presentation will be graded on the basis of

   (i) Scientific Content - Statement of problem, physical explanation and mathematical analysis (particular for graduate students).

   (ii) Quality of organization - conform to the format requirements, follow logical order for each section.

   (iii) Use of English - grammar, diction, language.

   (iv) Readability - clarity and appropriate level for audiences.

   (v) Quality of illustrations - captions for table and graphics, are they referred in the text and if the description adequate.

   (vi) References - adequate references, refer to references in text and illustration if these pieces are from the references.

   (vii) Length of report - must follow the length requirements

   (viii) Level of effort - how much work has been done in improving quality of the report.

   Presentations will be graded by instructor as well as your peers.

7. The references for topics listed here can be founded in the textbook. To determine which topic to choose, you can read the corresponding chapter in the text, Ref. 1 and Ref. 2 There are numerous journals for subjects related to optical networks, e.g. IEEE Journal of Quantum Electronics, Journal of the Optical Society B and Journal of the Optical Society A, Optics Letters, IEEE Photonics Technology Letters or Physical Review Letters. If you have problems in finding references, I can give you direction and help.
   Note: Our library has all the IEEE journals online. These invaluable sources of information can be accessed off-campus by going to http://www.uwm.edu/Library and entering article and journal information, following instruction to fill in your ePanther login and password when prompted or use the "Off-Campus URL Generator" (http://uwm.edu/libraries/databases/ezlinker).

Topics for the project

1. Novel concepts and ideas for add drop multiplexer.
2. Issues and possible solutions in implementing CDMA in optical networks.
3. Novel concepts and ideas for optical cross-connects.
4. Sensing network or smart sensors that involve multiplexing a number of sensors into one fiber.
5. Design a DWDM system under specific requirement including cost analysis, choices of components and possible areas of application.
6. Particular topics in Chapters 5, 7-13 (you can check the references at the back of each chapter).
7. Novel concepts and ideas for optical time division multiplexing.
8. Novel concepts and ideas for optical phase locked loops.
9. Optical fiber soliton transmission system
10. Applications of network protocol in optical networks, e.g. Multiprotocol Label Switching (MPLS).

Note: For more ideas, you can check out Chapters 6-12 of the textbook and references at the end of each chapter, Chapters 8-11, 18 in Ref. 4 and Chapters 7-10 in Ref. 3 in the syllabus as well as check the homepage of the course for links to various optics-related magazines.