Optical Networking (IO2654)

Course Syllabus and PM (VT2017, P4)

Course name: Optical Networking (Optiska Nätverk)

Course credits: 7.5 hp

Course code: IO2654

Level: 2nd cycle

School/Department/Division: School of Information and Communication Technology (ICT), Communication Systems (COS) Dept., Optical Networks Laboratory (ONLab).

Syllabus valid from term: VT2008.

Course objectives:

- Define the main possibilities and limitations of optical network technologies
- Identify and illustrate the main differences between optical networking and traditional networking
- Solve simple WDM network design and optimization problems
- Assess the concept and analyze/compare the benefits of various optical layer survivability strategies
- Identify, illustrate, and compare the main issues in management and control of optical networks

Main content: Basics on communication networks and layered network models, the optical layer, WDM network elements and design, optical packet and burst switching, optical network survivability, transmission system engineering, and optical devices and systems

Course literature: The course literature is posted on the course's homepage at least four weeks before the course starts. During the previous academic year the following literature was used:

- Biswanath Mukherjee: "Optical WDM Networks", Springer, 2006.

The material in the book is usually completed and enriched with material presented during class.

Additional readings for the course include:

- Jane M. Simmons, "Optical Network Design and Planning, 2nd edition", Springer, 2014.

- R. Ramaswami, K. Sivarajan, G. Sasaki: "Optical Networks: A Practical Perspective, 3rd edition", Morgan Kaufmann.

Language of instruction: All course literature is in English. Classes are also given in English and students must be able to follow discussion in English.

Prerequisites: students are required to have a basic knowledge in communication networks (i.e., basic definitions, network categories, and concepts). Students should have basic programming and coding skills (no specific language is required), enough to be able to carry out the project assignment as part of the course work.

Grading scale: A, B, C, D, E, FX, F

Examination: In order to pass the course students need to: pass a written exam, and turn in a large programming assignment:

- The written exam will take place at the end of the course, according to the time schedule provided at the beginning of the course.
- The project assignment consists in a programming exercise normally to be carried out in groups of two students. More details will be given each year in the course PM.

Other:

- A makeup written exam is usually given each year in August. The makeup session is valid as a replacement of the written exam only. It is not possible to make up for the project work.
- The grade for the project work is P (pass) or F (fail). The requirements to get a pass grade are specified in the course PM. If the project work is not turned in by the required deadline, then the course is not passed and the student is invited to come back the next time the course is given and to turn in the project assignment of that year.
- In some circumstances (e.g., a relatively low number of student registered to the course) the regular examination procedure (written exam + project assignment) might be replaced by an oral exam consisting of two parts (presentation of one technical paper + examination on the class content). The procedure for the oral examination is specified in the PM.
- With a low number of students the course might also be given in the form of self-study. In this case student will be given reading assignments each week. The exam will be in written form, where the student will be asked to solve a number of problems.

Course PM

Teachers:
Paolo Monti: +46 8 790 4076 (pmonti@kth.se)
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In VT2017, IO2654 will be given in the form of self-study. The book to be used, is the course book:

- Biswanath Mukherjee: “Optical WDM Networks”, Springer, 2006.

The material to be covered during each week of the course is the following:

- W16: Ch. 1 and Ch. 2
- W17: Ch. 5
- W18: Ch. 7
- W19: Ch. 8
- W20: Ch. 11 and Ch. 16
- W21: no reading assignments
- W22: exam

The teachers will be available to meet once a week for one hour to answer students questions. Meeting will have to be booked in advance via email by contacting Paolo Monti at pmonti@kth.se.
The calendar of the meeting dates will be provided during the first class.

During the first meeting the teacher will also provide more information about the written exam and which exercises from the book can be used to prepare for it.