



## **ECE607: High Speed Communications Networks**

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### **I. Outline**

- Introduction: Communication Networks
- SONET/SDH: The SONET Frame Structure
- SONET/SDH Devices, Self-Healing SONET/SDH Rings
- Data over SONET/SDH (DOS)
- ATM Networks: Structure of the Header of the ATM Cell
- The Physical Layer, the ATM Layer
- The ATM Switch Architecture
- The ATM Adaptation Layer
- Congestion Control in ATM Networks
- The Multi-Protocol Label Switching (MPLS): Architecture
- MPLS over ATM
- Wavelength Routing Networks: Lightpaths
- Traffic Grooming, Protection Schemes
- Optical Burst Switching: Scheduling of Bursts at an OBS Node
- The Jumpstart Project

### **II. Text Book and References**

- [1] Harry G. Perros, *Connection-Oriented Networks: SONET/SDH, ATM, MPLS and Optical Networks*. New York: Wiley, 2005. \*\* Text book \*\*
- [2] T. Venkatesh and C. Siva Ram Murthy, *An Analytical Approach to Optical Burst Switched Networks*. New York: Springer, 2010.
- [3] Rajiv Ramaswami, Kumar Sivarajan and Galen Sasaki, *Optical Networks: A Practical Perspective*. 3rd ed. San Francisco Morgan Kaufmann, 2010.
- [4] Govind P. Agrawal, *Fiber-Optic Communication Systems*. 4th ed. New York: Wiley, 2010.

### **III. Handouts and Assignments**

- Handouts and assignments can be downloaded from  
<http://teaching.alexeng.edu.eg/EE/hshalaby>

### **IV. Teaching and Assessments**

- Teaching hours per week:
  - 1) Lectures: 2 hrs.
  - 2) Tutorials and laboratories: 1 hr.

- Distribution of a total mark of 100:
  - 1) Class works (30 marks): These marks are divided among quizzes, reports, projects, presentations, lab examination, and class discussions.
  - 2) Midterm exam (20 marks): Closed book exam.
  - 4) Final exam (50 marks): Closed book exam.
- Attendance:
  - 1) Attendance is conducted every lecture and course activitie.
  - 2) Students that will be absent more than 25% of total teaching weeks shall be deprived from attending the final exam.