EECE 549 FREE-SPACE LASER COMMUNICATION
(Spring 2008)

Description: Introduction to the phenomena related to optical communications. The course spans over the fundamental concepts necessary for understanding design and performance of free-space laser communication systems. Starting from transmission and reception of optical energy, it presents the analysis of the overall link budget, including the effects of laser and detector technologies, acquisition, tracking, and atmospheric distortions. Technology issues and alternatives pertinent to the design of high-data-rate systems are also addressed.

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Office hours: TBA

Reference Texts:
R. Gagliardi and S. Karp, *Optical Communications*. ISBN 0-471-54287-3
S. Lambert and W. Casey, *Laser Communications in Space*. ISBN 0-89006-722-8
G. Agarwal, *Fiber-Optic Communication Systems*. ISBN 0-471-21571-6
G. Osche, *Optical Detection Theory*. ISBN 0-471-22411-1
H. Willebrand and B. Ghuman, *Free-Space Optics*. ISBN 0-672-32248-x

Prerequisites: Familiarity with electromagnetic theory, basic concepts of optics and electronics, elementary differential equations, and fundamental principles of communications theory

Course Topics:
1. Optical Communication Systems
2. Optical Field Reception
3. Photodetection
4. Direct Detection
5. Heterodyne Detection
6. Optical Digital Communication
7. Pointing, Acquisition, and Tracking.
8. Atmospheric Effects

Grading:
Homeworks – 20%
2 Exams – 25% each
Final Exam – 30%

TOTAL 100%

Policy:
Discussions among students regarding homework assignments are strongly encouraged; however, each student must show his/her individual effort. Partial credit is given. Any form of academic dishonesty will be penalized. Anyone caught cheating will receive a zero for that assignment, plus the final grade will be reduced by one letter grade.

This course is also offered under the articulation agreement between Binghamton University and SUNYIT. It is available to qualified students at Binghamton University via the distance learning system Enginet.