Optical Communication

ECE 494

Presented By: Martins Innus
Outline

-History of Optical Communication
-System Description
-Channel Comparisons
-Descriptions of Channels
-Modulation
-Detection
-Amplification
Background

- Early Systems
- Beacons
- Colonial Times
- Optical Telegraph
- Alexander Graham Bell
Basic System Configuration

Figure 2.1 A generalized optical communication link.
Fiber Systems

- Advances
- Low Loss
- High Data Rate
- Size
- Disadvantages
Free Space Systems

- Compared to EM
- Available Spectrum
- Beam Size
- Disadvantages
Fiber Characteristics

Long-Haul using repeaters:

Repeaterless Long-Haul:

Broadcast:

To other receivers
Free Space Characteristics

-Satellites
-Uses For
-Acquisition and Tracking
Optical Amplification

- Forced Stimulated Emission
- SLA
- Pump
- Addition of Noise
- Representation
Modulation and Detection

- FM, PM, AM, IM, PLM
- Coherent or Direct Detection
- Noise in Detection
Summary

- Advantages to Optical Communication
- Choice of Systems
- Analogies to traditional systems
- Caveats