EL4. Wireless Optical Communication (3-0-0)

Unit 1 (13 Hours)
Introduction
Technology Overview System Configurations Evolution of Infrared Communication Systems The Optical Wireless Channel Design Fundamentals Power Budget Considerations. ATMOSPHERIC TRANSMISSION LIMITATIONS: Introduction to Atmospheric Propagation Important Definitions Atmospheric Transmission effect of fog, Rain, and Mist Scintillation.

DATA TRANSMISSION LIMITATIONS AND EYE SAFETY: Data Transmission Limitations Eye Safety Extended vs. Collimated Sources Holographic Diffusers

Unit 2 (13 Hours)
LEDs vs. LDs Special Considerations for Outdoor Systems
OPTICAL CONCENTRATORS: Overview of Optical Concentrators Wireless IR Receiver Requirements Optical Filters Optical Concentrators DTIRC Characteristics Comparison of Concentrators Practical Issues Other Shapes of DTIRC.

Optical Wireless Transmitter Design: Introduction to Optical Wireless Transmitter Design Transmitter Design Considerations Optical Source Characteristics Types of Optical Modulation Driver Circuit Design Concepts Current Steering Output Circuit Back Termination Circuit Predriver Data Retiming Automatic Power Control Transmitters Linearization Techniques

Unit 3 (14 Hours)
Optical Wireless Receiver Design:
Receiver Design Considerations Photo detection in Reverse-biased Diodes Choosing the Photo detector Receiver Noise Consideration Bit Error Rate and Sensitivity Bandwidth Signal Amplification Techniques Receiver Main Amplifier (RMA) Transceiver Circuit Implementation Technologies: Hybrid and Monolithic Integration

MODULATION, CODING, AND MULTIPLE ACCESS
Introduction to Modulation and Multiple Access Techniques Modulation Techniques Comparison Modulation Schemes in the Presence of Noise Modulation Schemes in the Presence of multipath Distortion Multiple Access Techniques
WIRELESS IR NETWORKING. Introduction to Wireless IR Networking Network Architecture Optical Wireless Network Specifications. The Ad Hoc Network Quality of Service (QoS) Future Infrared Networking

Text Books

1. Optical wireless communication: IR for Wireless Connectivity Roberto Ramirez-Iniguez, Sevia M. Idrus, Skudai Johor; Ziran Sun ,CRC Press

2. Optical and wireless communications, Next Generation Networks, Matthew W.O.Sadiku.Prairie View A&M University, Texas, USA