

## **Approval: OTA in 2<sup>nd</sup> Convocation Meeting**

**Course Name: OFDM for Optical Communications**

**Course number: EE 612**

**Credit: 3**

**Course Outline:**

### **Introduction**

Mathematical Formulation of an OFDM Signal, Discrete Fourier Transform Implementation of OFDM, Cyclic Prefix for OFDM, Spectral Efficiency for Optical OFDM, Cross-Channel OFDM: Multiplexing without Guard Band, Complex and Real Representations of an OFDM Signal, Peak-to-Average Power Ratio of OFDM Signals, Frequency Offset and Phase Noise Sensitivity, Frequency Offset Effect, Phase Noise Effect.

### **Coding for Optical OFDM Systems**

Linear Block Codes, Cyclic Codes, Bose–Chaudhuri–Hocquenghem Codes, Reed–Solomon Codes, Concatenated Codes, and Product Codes, Codes on Graphs, Turbo Codes, Turbo Product Codes, LDPC Codes, Generalized LDPC Codes, Symbol Error rate for QAM (16, 64, 256, ... M-QAM)

### **Various Types of Optical OFDM**

Coherent Optical OFDM, Principle of CO-OFDM, Optical Transmitter Design for CO-OFDM, Up-/Down-Conversion Design Options for CO-OFDM Systems, Optical I/Q Modulator for Linear RF-to-Optical up Conversion, Receiver Sensitivity for CO-OFDM, Direct Detection Optical OFDM

### **OFDM Applications in Access Optical Networks**

OFDM in Radio-over-Fiber Systems, OFDM in Passive Optical Networks, Ultra Wideband Signals and Optical OFDM.