LESSON PLAN

B.Sc. Physical Sciences (Electronics)
VI Sem. (CBCS)
18th January, 2024 to 11th May, 2024

Teacher - Mr. Ravinder Kumar
Paper - Photonic Devices & Power Electronics
UPC - 42517615
Mid Semester Break - 24th March, 2024 to 31st March, 2024

S. No	Date	Topic	Lectures
1	Jan. 18 – Jan. 20	**Unit-1** 1. **Classification of Photonic devices**: Interaction of radiation and matter 2. Radiative transition and optical absorption.	2
2	Jan. 22 – Jan. 27	**Unit-1 Continue….** 1. **Light Emitting Diodes**- Construction. 2. Light Emitting Diodes-materials and operation 3. **Semiconductor Laser**: Condition for amplification, laser cavity. 4. Hetero-structure and quantum well devices.	4
3	Jan. 29 – Feb. 3	**Unit-1 Continue….** 1. Charge carrier and photon confinement, 2. Line shape function, Threshold current. **3. Laser diode** 4. Laser diode continue….	4
4	Feb. 12 – Feb. 17	**Unit-2** 1. **Photodetectors:** Photoconductor. 2. Photodiodes (p-i-n, avalanche) 3. Photo transistors, quantum efficiency and responsivity. 4. Photomultiplier tube	4
5	Feb. 19 – Feb. 24	**Unit-2 Continue….** 1. **Solar Cell:** Construction and working. 2. Characteristics of solar cell. 3. Revision Class 4. Test	4

6	Feb. 26 – Mar. 02	**Unit-2 Continue….** 1. **LCD Displays:** Types of liquid crystals, 2. Principle of Liquid Crystal Displays 3. Principle of Liquid Crystal Display continue…. 4. Applications of LCD and advantages over LED displays	4
7	Mar. 04 – Mar. 09	**Unit-3** 1. **Introduction to Fiber Optics:** Evolution of fiber optic system- 2. Element of an Optical Fiber Transmission link 3. Element of an Optical Fiber Transmission link continue… 4. **Ray Optics**-Optical Fiber Modes and Configurations	4
8	Mar. 11 – Mar. 16	**Unit-3 Continue….** 1. Ray Optics-Optical Fiber Modes and Configurations continue… 2. Mode theory of Circular Wave guides- 3. Mode theory of Circular Wave guides continue…. 4. Overview of Modes-Key Modal concepts-	4
9	Mar. 18 – Mar. 23	**Unit-3 Continue….** 1. Overview of Modes-Key Modal concepts continue…. 2. Linearly Polarized Modes 3. Single Mode Fibers- 4. Graded Index fiber structure.	4
10	Apr.01 - Apr. 06	**Unit-4** 1. **Power Devices:** Need for semiconductor power devices. 2. Power MOSFET (Qualitative). 3. Introduction to family of thyristors. 4. Silicon Controlled Rectifier (SCR)- structure, I-V characteristics (SCR),	4
11	Apr.08 - Apr. 13	**Unit-4 Continue….** 1. Turn-On and Turn-Off characteristics, ratings (SCR) 2. Gate-triggering circuits. 3. **Diac** and **Triac**- Basic structure. 4. Working and V-I characteristics of diac and triac	4

12	Apr.15 - Apr. 20	**Unit-4 Continue….** 1. Application of Diac as a triggering device for Triac. 2. **Insulated Gate Bipolar Transistors (IGBT):** Basic structure, 3. I-V Characteristics, switching characteristics of IGBT 4. Limitations and safe operating area (SOA) of IGBT	4
13	Apr.22 - Apr. 27	**Unit-5** 1. **Application of SCR:** Phase controlled rectification 2. AC voltage control using SCR. 3. Triac as a switch. 4. Power Invertors- Need for commutating circuits and their various types	4
14	Apr 29 – May 04	**Unit-5 Continue….** 1. Commutating circuits and their various types Dc link invertors 2. Parallel capacitor commutated invertors. 3. Series Invertor its limitations and improved versions 4. Bridge invertors.	4
15	May 06 – May 11	1. Revision class 2. Revision Class 3. Test 4. Doubt Class	4