***Session 1:***

**Transport of Substances Through Cell Membranes:**

**THE CELL MEMBRANE CONSISTS OF A LIPID BILAYER WITH CELL MEMBRANE TRANSPORT PROTEINS**

**DIFFUSION**

**DIFFUSION THROUGH PROTEIN PORES AND CHANNELS—SELECTIVE PERMEABILITY AND “GATING” OF CHANNELS**

**FACILITATED DIFFUSION REQUIRES MEMBRANE CARRIER PROTEINS**

**OSMOSIS ACROSS SELECTIVELY PERMEABLE MEMBRANES—“NET DIFFUSION” OF WATER**

**“ACTIVE TRANSPORT” OF SUBSTANCES THROUGH MEMBRANES**

***Session 2:***

**Membrane Potentials and Action Potentials:**

**BASIC PHYSICS OF MEMBRANE POTENTIALS**

**MEASURING THE MEMBRANE POTENTIAL**

**RESTING MEMBRANE POTENTIAL OF NEURONS**

**NEURON ACTION POTENTIAL**

**INITIATION OF THE ACTION POTENTIAL**

**SPECIAL CHARACTERISTICS OF SIGNAL TRANSMISSION IN NERVE TRUNKS**

***Session3:***

***Contraction of Skeletal Muscle:***

**PHYSIOLOGICAL ANATOMY OF SKELETAL MUSCLE**

**GENERAL MECHANISM OF MUSCLE CONTRACTION**

**MOLECULAR MECHANISM OF MUSCLE CONTRACTION**

**CHARACTERISTICS OF WHOLE MUSCLE CONTRACTION**

**Excitation of Skeletal Muscle: Neuromuscular Transmission and Excitation-Contraction Coupling**

**EXCITATION-CONTRACTION COUPLING**

**MUSCLE ACTION POTENTIAL**

***Session 4:***

**Excitation and Contraction of Smooth Muscle**

**CONTRACTION OF SMOOTH MUSCLE**

REGULATION OF CONTRACTION BY CALCIUM IONS

NERVOUS AND HORMONAL CONTROL OF SMOOTH MUSCLE CONTRACTION