24. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome (SLO)	Descriptors **	Learning Types (Face to Face/Blended/ Fully Online)	Platform Used
1	1.1 and 1.2	**Introduction to homeostasis and cell membrane physiology**	Differentiate between negative & positive feedback in maintaining homeostasis, use appropriate examples in each case (blood pressure regulation, hemostasis etc). Distinguish between the different components of the cell membrane, how such differences affect membrane permeability. Apply these basic principles in more complicated physiological concepts.	K K C	Face to face	
2	2.1 and 2.2	**Transport-I (Passive), Transport-II (Active)**	Recognize the different types of transport systems (Passive vs. active); their features, significance, sites etc.	K	Face to face	
3	3.1 and 3.2	**Physiological units, Body fluid compartments**	Distinguish between different types of units and terms used in physiology such as moles, osmoles, equivalent, osmosis & osmotic pressure. Identify body fluid compartments in term of fluid distribution & measurements. Know the constituents of EC & IC fluids in term of solutes, electrolytes, osmolarity etc. Predict the logic behind using different units in expressing concentrations.	K K S	Face to face	

4	4.1 and 4.2	**Abnormalities of body fluid**	Distinguish between different types of body fluid abnormalities: hypo-osmotic dehydration & overhydration, hyper-osmotic dehydration & overhydration. Differentiate between different types of edema (intracellular vs. extracellular; pitting vs. nonpitting; generalized vs. localized etc)	K K	Face to face	
5	5.1 and 5.2	**Excitable Membranes:** **Resting Membrane Potential, Electrochemical Equilibrium (Nernst Equation), (Goldman Hodgkin Katz equation)**	Predicts the basis of membrane excitability. Resting membrane potential: origin and determinants, distribution of different ions across cell membranes. Calculate electrochemical equilibrium for Na+, K+, Ca++, and Cl- using Nernst equation as a predictor for RMP plus other more complicated equations (e.g. Goldman-Hodgkin-Katz equation).	K S	Face to face	
6	6.1 and 6.2	**Action potential:** **Phases, Conduction, Cardiac Action Potential.**	Describe the phases of action potential and the ion channels involved in each phase. Compare and contrast between different types of action Potential AP: Fast response AP vs slow response AP.	K K	Face to face	
7	7.1 and 7.2	**Synapse, Excitatory Post Synaptic and Inhibitory Post Synaptic Potential.**	Identify synaptic function, basis of action potential generation and conduction and differentiate between excitatory post synaptic potential and inhibitory post synaptic potential.	K	Face to face	
8						
9	9.1 and 9.2	**Microcirculation capillary structure; fluid filtration & reabsorption (Starling Forces)**	Calculate the net filtration pressure across capillary membranes. Distinguish between physiology of microcirculation and its related pathological changes and thus the formation of edema	S K	Face to face	

10	10.1 and 10.2	**Basic neuronal circuits**	Differentiate between all factors affecting basic neuronal circuits: synapses: types, transmission of AP, neurotransmitters, facilitation, inhibition, summation, electrical events, processing, fatigue…etc.	K	Face to face	
11	11.1 and 11.2	**Neurons,** **Neurotransmitters**	Differentiate the different types of neurons and the basis of their classifications Predict the different effects of neurotransmitters on their specific receptors	K K	Face to face	
12	12.1 and 12.2	**ANS (Autonomic Nervous System)**	Compare and contrast the two divisions of the autonomic nervous system; sympathetic and parasympathetic.	K	Face to face	
13	13.1 and 13.2	**Receptors and signal transduction**	Compare the basis of different types of signal transduction, mechanism of actions, and mediators.	K	Face to face	
14	14.1 and 14.2	**Steroids signal transduction**	Describe mechanism of steroid hormones actions.	K	Face to face	