Human Physiology

Course No.	Title of Course	Credit Hours
HPS-111	Human Physiology	3(2-1)

Learning Outcomes

After completing the course, the students will be able to.

• Assess functionality of body system in normal and diseased state

• Elucidate the assessment and prognosis of different diseases

• Perform general clinical tests to assess organs malfunctioning

SDGs addressed in the course:

SDG # 3 (Health and Well-being)

SDG # 4 (Quality Education)

Teaching Mode: This course will be taught in hybrid learning mode offering a substantial
portion of contents and course activities online through learning management system.

Course Contents

Theory

Introduction to human physiology: Organization level and cell physiology; Digestive system. Oral cavity, salivary glands, teeth, tongue, esophagus, pharynx, larynx, stomach, small intestine, large intestine, accessory glands associated with gastro intestinal track (GIT) (liver, gallbladder and pancreas); Urinary system: Introduction, functions of kidney and nephron, glomerular filtration, tubular reabsorption, tubular secretion, urine excretion and plasma clearance, fluid and acid base balance; Cardiovascular system: Functions of heart and blood vessels: Electrical activity of heart, mechanical events of heart, cardiac output and its control. Practical: Blood grouping; Hb estimation; Counting of blood cells; Complete blood count (CBC); Electrolyte estimation; Hydration test; Determination of coagulation time; Blood pressure: Pulse recording; Heart activity; Electrocardiography; Test for saliva; Respiratory movement:
Maximum breathing capacity, pulmonary function test; Intestinal motility; Renal function

tests and urine analysis.

Week wise Lecture Plan

Week No	Description
1	Introduction to human physiology
2	Organization level and cell physiology
3	Digestive system – upper GIT Oral cavity, salivary glands Teeth, tongue, esophagus, pharynx, larynx,
4	Digestive system – Lower GIT Physiology of stomach, small intestine, large intestine
5	Functions of accessory glands associated with gastro intestinal track (GIT) (liver, gallbladder and pancreas)
6	Introduction to Urinary system Functions of kidney and nephron, glomerular filtration, tubular reabsorption, tubular secretion
7	Urine excretion and plasma clearance
8	Fluid and acid base balance
9	**MID SEMESTER EXAMS**
10	Introduction to Cardiovascular system Functions of heart and blood vessels
11	Electrical activity of heart, mechanical events of heart, cardiac output and its control.
	PRACTICALS
12	Blood grouping; Hb estimation;
13	Counting of blood cells; Complete blood count (CBC); Electrolyte estimation
14	Hydration test; Determination of coagulation time
15	Blood pressure, Pulse recording; Heart activity; Electrocardiography

16	Respiratory movement, Maximum breathing capacity, pulmonary function tests
17	Intestinal motility; Renal function tests and urine analysis.
18	**END SEMESTER EXAMINATION**

A: List of Experiments

Lab Number	**Equipment**	**Experiment Detail**
1	Centrifuge	Blood grouping: Study and description of blood cells. ABO typing is performed by taking a sample of blood, placing it in a centrifuge, and separating red blood cells (RBCs) from serum/plasma. A "front," or forward type, and "back," or reverse type, are then performed.
2	Photoelectric colorimeter	Hb estimation: This is done by adding both potassium cyanide and ferricyanide whose absorbance is then measured at 540 nm using a photoelectric colorimeter against a standard quality control solution. The Hb concentration is then determined by the result produced by the photoelectric colorimeter
3	Refractometer Urine color chart	Hydration test Urine specific gravity — using a refractometer to measure the specific gravity of a urine sample. Urine color — determining hydration level by comparing the urine color to a chart.
4	Filter paper	**Determination of coagulation time** The time from the beginning of incision until the termination of bleeding is considered as the BT. A standard filter paper should be used every 30 seconds to draw off it until the blood completely stops. The normal BT values run in the range of 2-9 minutes.

5	Sphygmomanometer, electrodes, wires and ECG machine	Blood pressure, Pulse recording; Heart activity; Electrocardiography
6	Spirometer	Pulmonary function tests
7	Gamma camera scintigraphy	Intestinal motility
		Lab Exam