

Grade10

Domains	Standards	Benchmarks	Topic/Title	NCP SLO #	SLO	Status of SLOs	SLOs for Assessment	Cognitive Domain
G: Nervous System	Students should be able to: Describe the structure and function of the nervous system, including the central and peripheral nervous systems. Explain the role of neurons in transmitting and processing information. Describe the process of neurotransmission and how it affects the functioning of the nervous system. Explain how the	Students will be able to describe the organization of the nervous system into the central and peripheral nervous system, and explain the role of the brain, spinal cord, and nerves in transmitting signals and coordinating responses	Nervous System	[SLO: B-10-G-01]	Describe the nervous system and its role.	Modified(rephrased) SLO		Understand
				[SLO: B-10-G-02]	Discuss the central nervous system and peripheral nervous system	Modified(rephrased) SLO		Understand
				[SLO: B-10-G-03]	Outline the types of neurons with diagrams.	Modified(rephrased) SLO		Analyse
				[SLO: B-10-G-04]	Define a stimulus with examples.	Modified(rephrased) SLO		Remember
				[SLO: B-10-G-05]	State that nerve impulses are electrical signals that travel across neuron	Modified(rephrased) SLO		Remember
				[SLO: B-10-G-06]	Define and sketch synapses.	New SLO		Understand
				[SLO: B-10-G-07]	Introduce neurotransmitters .	Modified(rephrased) SLO		Remember
				[SLO: B-10-G-08]	Explain through sketching a diagram the involvement of the nervous system when a person accidentally touches something painfully hot and withdraws their hands as a reflex..	Modified(rephrased) SLO		Analyse
				[SLO: B-10-G-09]	Explain the Endocrine system	Modified(rephrased) SLO		Understand
				[SLO: B-10-G-10]	Identify the major endocrine glands and hormones with their functions.	Modified(rephrased) SLO		Analyse
H: Reproduction and Inheritance	Students should be able to: Describe the processes of reproduction in organisms, including asexual and sexual reproduction. Explain the role of meiosis in producing genetically diverse offspring. Describe the structure and	Students will be able to explain the differences between asexual and sexual reproduction, and describe the steps involved in the process of fertilization, development, and birth.	Reproduction and Inheritance	[SLO: B-10-H-01]	Describe the role of hormones in both male and female sexual development.	Modified(rephrased) SLO		Understand
				[SLO: B-10-H-02]	Describe the process of gametogenesis and fertilization.	Modified(rephrased) SLO		Understand
				[SLO: B-10-H-03]	Describe asexual reproduction and sexual reproduction mechanisms with examples (plants and animals)	Modified(rephrased) SLO		Understand
				[SLO: B-10-H-04]	Describe sex determination in humans.	Modified(rephrased) SLO		Understand
				[SLO: B-10-H-05]	Sketch the structure of chromosomes..	Modified(rephrased) SLO		Understand
				[SLO: B-10-H-06]	Define genotype and phenotype, allele homozygous, heterozygous, dominant, recessive	Modified(rephrased) SLO		Remember

	function of gametes and the role of fertilization in			[SLO: B-10-H-07]	Illustrate Mendelian inheritance laws through monohybrid and dihybrid cross.	Modified(rephrased) SLO		Remember
I: Disease and Immunity	Students should be able to: Describe the causes of diseases, including infectious and non-infectious diseases. Explain the role of pathogens, including viruses, bacteria, fungi, and parasites, in causing disease. Describe the body's immune response to pathogens, including the role of white blood cells, antibodies, and the complement system. Explain how vaccines work and the importance of herd immunity. Describe how genetic factors can affect susceptibility to disease and describe examples of inherited diseases. Explain the	Students will be able to explain the mechanisms of the immune system, including the role of white blood cells, antibodies, and vaccines, and describe how they protect the body against invading pathogens and promote recovery from infection.	Disease and Immunity	[SLO: B-10-I-01]	Define disease, illness and infection and pathogen.	Modified(rephrased) SLO		Remember
				[SLO: B-10-I-02]	List the 4 different types of pathogens (Viruses, Bacteria, Plasmodium, Fungi). and list their common diseases	Modified(rephrased) SLO		Remember
				[SLO: B-10-I-03]	Discuss antibiotics	Modified(rephrased) SLO		Understand
				[SLO: B-10-I-04]	Discuss the development of resistance in bacteria.	Modified(rephrased) SLO		Understand
				[SLO: B-10-I-05]	Define immunity and List the roles of the immune system.	Modified(rephrased) SLO		Understand
				[SLO: B-10-I-06]	Describe the components of the immune system (Lymphatic system (lymph nodes), Types of immune cells and their roles, Innate immunity, adaptive immunity and the three lines of defense)	Modified(rephrased) SLO		Understand
				[SLO: B-10-I-07]	Describe the process of blood clotting.	Modified(rephrased) SLO		Understand
				[SLO: B-10-I-08]	State that the function of adaptive immunity	Modified(rephrased) SLO		Remember
				[SLO: B-10-I-09]	Discuss that vaccines help boost immunity with examples.	Modified(rephrased) SLO		Understand
				[SLO: B-10-I-10]	Describe the discovery of penicillin.	Modified(rephrased) SLO		Understand
				[SLO: B-10-I-11]	Define Diabetes and its subtypes explain the effects on the human body .	Modified(rephrased) SLO		Understand
				[SLO: B-10-I-12]	Discuss cancer and its effects on the human body. .	Modified(rephrased) SLO		Understand
				[SLO: B-10-I-13]	Narrate Covid 19 and list the harmful effects on the human body.	Modified(rephrased) SLO		Understand
				[SLO: B-10-I-14]	Discuss that HIV compromises the Immune system and over times leads to development Acquired Immune Deficiency Syndrome (AIDS)	Modified(rephrased) SLO		Analyse

	Explain the mechanisms of immune tolerance and autoimmunity and their impact on human health.			[SLO: B-10-I-15]	Explain plant diseases commonly present in Pakistan, in terms of their effect on plant health and yield and their treatment. (Rust, smut, red rot of sugarcane)	Modified(rephrased) SLO		Understand
J: Biotechnology	Students should be able to:	Explain the basic principles of biotechnology, and applications in agriculture, medicine, gene editing, marine biology, environment and industry.	Biotechnology	[SLO: B-10-J-01]	Introduce biotechnology.	Modified(rephrased) SLO		Understand
	[SLO: B-10-J-02]			Explain with examples that food biotechnology has advanced agriculture especially inside Pakistan.	Modified(rephrased) SLO		Understand	
	[SLO: B-10-J-03]			Explain with examples that medical biotechnology has advanced healthcare in diabetes and cancer.	Modified(rephrased) SLO		Understand	
	[SLO: B-10-J-04]			State the potential advantages that genetic editing provides with examples in the context of medicine and agriculture.	Modified(rephrased) SLO		Remember	
	[SLO: B-10-J-05]			Describe with examples the benefits of marine biotechnology.	Modified(rephrased) SLO		Understand	
	[SLO: B-10-J-06]			Describe that bioremediation can help us in taking better care of our environment with an example.	Modified(rephrased) SLO		Understand	
	[SLO: B-10-J-07]			Explain the concept and applications of industrial biotechnology with examples.	Modified(rephrased) SLO		Understand	
K: Biostatistics and Data Handling	biology, including descriptive statistics, inferential statistics, and	Collect, analyze, and interpret data using appropriate statistical	Biostatistics and Data Handling	[SLO: B-10-K-01]	Define biostatistics and its uses.	New SLO		Remember
				[SLO: B-10-K-02]	Define and calculate mean, median and mode,	New SLO		Apply
				[SLO: B-10-K-03]	Sketch a bar chart for a given set of biological data.	New SLO		Remember
				[SLO: B-10-R-01]	Describe the needs of ingestion, digestion, absorption, assimilation and egestion.	Matched SLO		Understand
				[SLO: B-10-R-02]	Identify and describe the structures of the main regions of the alimentary canal and the associated organs.	Matched SLO		Understand

R: Human Physiology	Students should be able to: Describe the structure and function of the various systems of the human body, including the skeletal, muscular, respiratory, circulatory, digestive, urinary, and nervous systems. Explain the role of hormones in regulating body functions and describe the endocrine system. Describe the processes of cellular respiration and energy production and their relationship to human health. Explain how	NA	Human Physiology	[SLO: B-10-R-03]	Describe swallowing and peristalsis.	Matched SLO		Understand
				[SLO:B-10-R-04]	Sort out the action of enzymes in specific regions of alimentary canal, with respect to their substrates and products.	Matched SLO		Analyse
				[SLO: B-10-R-05]	State the role of the liver.	Modified(rephrased) SLO		Remember
				[SLO:B-10-R-06]	Describe the structure of a villus, including the roles of capillaries and lacteals.	Matched SLO		Understand
				[SLO: B-10-R-07]	State the signs and symptoms, causes, treatments and preventions of the disorders of gut i.e. diarrhea, constipation, and ulcer.	Matched SLO		Remember
				[SLO: B-10-R-08]	Describe how the blood is circulated inside the human body.	Modified(rephrased) SLO		Understand
				[SLO: B-10-R-09]	Explain how blood is used to transport materials throughout the human body.	Modified(rephrased) SLO		Understand
				[SLO: B-10-R-10]	Identify the different types of organs connected to the blood system and their roles.	Modified(rephrased) SLO		Remember
				[SLO: B-10-R-11]	Identify the different components that make up the blood	Modified(rephrased) SLO		Remember
				[SLO: B-10-R-12]	Name the cell types found in blood and their roles.	Modified(rephrased) SLO		Remember
				[SLO: B-10-R-13]	Explain the structure of the heart with a diagram.	Modified(rephrased) SLO		Understand
				[SLO: B-10-R-14]	Explain common heart diseases. (Coronary Heart Disease, Myocardial Infarction, Angina)	Modified(rephrased) SLO		Understand
				[SLO: B-10-R-15]	Explain the harmful effects of smoking related to heart diseases	Modified(rephrased) SLO		Understand
				[SLO: B-10-R-16]	Identify the different organs of urinary system.	Matched SLO		Remember
				[SLO: B-10-R-17]	Relate the structure of the kidney with its function.	Matched SLO		Understand
[SLO:B-10-R-18]	State that nephron is the excretory unit of kidney.	Matched SLO		Remember				

<p>the human body maintains homeostasis and the role of feedback mechanisms. Describe how the different systems of the body interact to maintain health and respond to disease and injury.</p>	[SLO: B-10-R-19]	Locate the different parts of nephrons and relate them with their function.	Matched SLO		Understand
	[SLO: B-10-R-20]	State that main role of the kidney is urine formation.	Modified(rephrased) SLO		Remember
	[SLO: B-10-R-21]	Describe that urine formation involves three processes i.e. filtration, reabsorption and secretion.	Modified(rephrased) SLO		Understand
	[SLO: B-10-R-22]	Explain that the kidney plays an important role in osmoregulation. Identify the causes and treatment of kidney stones.	Modified(rephrased) SLO		Understand
	[SLO: B-10-R-23]	Outline the causes of kidney failure and treatments.	Modified(rephrased) SLO		Understand
	[SLO: B-10-R-24]	Describe the roles of the parts of the air passageway and lungs.	Modified(rephrased) SLO		Remember
	[SLO: B-10-R-25]	<ul style="list-style-type: none"> Describe the mechanism of breathing in terms of movements ribs and diaphragm. 	Matched SLO		Understand
	[SLO: B-10-R-26]	Differentiate between the composition of inspired and expired air.	Matched SLO		Understand
	[SLO: B-10-R-27]	Discuss briefly diseases related to respiratory system like bronchitis, emphysema, pneumonia, asthma, and lung cancer	Modified(rephrased) SLO		Understand
	[SLO: B-10-R-28]	Describe infectious and non infectious diseases and their types with examples	Modified(rephrased) SLO		Understand
	[SLO: B-10-R-29]	Define zoonotic diseases and give their types.	Modified(rephrased) SLO		Remember
	[SLO: B-10-R-30]	Describe vector borne diseases with examples	Modified(rephrased) SLO		Understand
	[SLO: B-10-R-31]	Enlist allergies with some common types.	Modified(rephrased) SLO		Remember
	[SLO: B-09-10-X-01]	<p>Students should to able to simple measurements in SI Units of:</p> <ul style="list-style-type: none"> volumes of gases or solutions/liquids – masses – temperatures – times – lengths: : 	New SLO		Apply

				<p>[SLO: B-09-10-X-02]</p> <p>Students should be able to carry out simple experiments of:</p> <ul style="list-style-type: none"> • diffusion • osmosis • food tests • rates of enzyme-catalysed reactions • pH and the use of hydrogencarbonate indicator, litmus and universal indicator • photosynthesis (rate and limiting factors) • effect of mineral ions on plant growth • transpiration • heart rate and breathing rate • respiration • tropic responses • nervous responses • observation and dissection of seeds and flowers • germination • continuous and discontinuous variation • sampling techniques 	New SLO		Apply
				<p>[SLO: B-09-10-X-03]</p> <p>Should be able to use of a microscope to examine biological specimens</p>	New SLO		Understand
				<p>[SLO: B-09-10-X-04]</p> <ul style="list-style-type: none"> • calculating the magnification of biological specimens 	New SLO		Apply

mentation Skills	Students should be able to demonstrate knowledge of common experimental	: Understand the terminology and	tion Skills	[SLO: B-09-10-X-05]	Students should:be able to select and safely use techniques, apparatus and materials <ul style="list-style-type: none"> • – identify apparatus from diagrams or descriptions • – draw, complete or label diagrams of apparatus and biological specimens • – use, or explain the use of, common techniques, apparatus and materials • – select the most appropriate apparatus or method for the task and justify the choice made • – describe food tests • – describe tests to determine the pH of solutions and substances using a universal indicator • – describe and explain techniques • –describe and explain hazards and identify safety precautions to ensure the accuracy of observations and data 	New SLO		Analyse
				[SLO: B-09-10-X-06]	Students should be able to understand for safety measurements and precautions <ul style="list-style-type: none"> - understand the need to wear PPE - tie up long hair - Wear goggles when dealing with caustic materials 	New SLO		Understand

Domain X: Experimentation	terminology and how to select and safely use techniques, apparatus and materials	methodology with various experimental techniques.	Experimental	[SLO: B-09-10-X-07]	Students are able to Understand and express scientific ideas using the below terms: - True value: the value that would be obtained in an ideal measurement - Measurement error: the difference between a measured value and the true value of a quantity - Accuracy: a measurement result is described as accurate if it is close to the true value - Precision: how close the measured values of a quantity are to each other - Repeatability: a measurement is repeatable if the same or similar result is obtained when the measurement is repeated under the same conditions, using the same method, within the same experiment - Reproducibility: a measurement is reproducible if the same or similar result is obtained when the measurement is made under either different conditions or by a	New SLO		Evaluate
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				[SLO: B-09-10-X-08]	Students are able to a. identify the independent variable and dependent variable b. describe how and explain why variables should be controlled c. suggest an appropriate number and range of values for the independent variable d. suggest the most appropriate apparatus or technique and justify the choice made e. describe experimental procedures f. identify risks and suggest appropriate safety precautions g. describe how to record the results of an experiment h. describe how to process the results of an experiment to form a conclusion or to evaluate a prediction i. make reasoned predictions of expected results	New SLO		Evaluate
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					<ul style="list-style-type: none"> – take readings from apparatus (analogue and digital) or from diagrams of apparatus – take readings with appropriate precision, reading to the nearest half-scale division where required – correct for zero errors where required – make observations, measurements or estimates that are in agreement with expected results or values – take sufficient observations or measurements – repeat observations or measurements where appropriate – record qualitative observations from tests – record observations and measurements systematically, for example in a suitable table, to an appropriate degree of precision and using appropriate units
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New SLO

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Analyse

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