Singapore Junior Biology Olympiad (SJBO) Training

Course Syllabus

Lesson	Topic	Contents
1.01	Cell Biology	Biomolecules I: Organic Chemistry, Carbohydrates and Lipids
1.02		Biomolecules II: Proteins, Nucleic Acids and Micronutrients
1.03		Organelles and its Functions
1.04		Membrane Structure and Function
1.05		Metabolism and Enzymes
1.06		Cellular Respiration and Fermentation I
1.07		Cellular Respiration and Fermentation II
1.08		Photosynthesis
1.09		Cell Communication
1.10		Necrosis and Apoptosis
1.11		Cell Cycle and Mitosis
2.01	Plant Anatomy and Physiology	Vascular Plant Structure, Growth and Development
2.02		Transport in Vascular Plants
2.03		Angiosperm Reproduction
2.04		Plant Responses to Internal and External Signals
3.01	Animal Anatomy and Physiology	Basic Principles of Animal Anatomy and Physiology
3.02		Animal Nutrition I: Mouth, Oesophagus and the Stomach
3.03		Animal Nutrition II: Small Intestine and the Large Intestine
3.04		Circulatory System
3.05		Respiratory System
3.06		Immune System: Innate and Adaptive Immune Systems
3.07		Osmoregulation and Excretion
3.08		Hormones and Endocrine System
3.09		Animal Reproduction: Reproductive Organs and Sex Hormones
3.10		Animal Development: Cleavage, Morphogenesis and Cytoplasmic Determinants
3.11		Nervous System I: Neurons and Action Potential
3.12		Nervous System II: Brain Structure and Function, Memory and Nervous Disorders
3.13		Hearing, Seeing, Tasting and Smelling
3.14		Muscles and the Skeleton
4.01	Ethology	Animal Behaviour
5.01	Genetics	Meiosis and Sexual Cycles
5.02		Mendelian Genetics I: Inheritance Patterns for 1 and 2 Genes
5.03		Mendelian Genetics II: Dominant and Recessive Traits, Multifactorial Diseases and Sex-Linked Genes
5.04		Chromosomal Basis of Inheritance: Linked Genes, Genetic Disorders and Genomic Imprinting
5.05		Molecular Basis of Inheritance: DNA Structure and DNA Replication

5.06		Gene Expression, Transcription and Translation
5.07		Regulation of Gene Expression
5.08		Viruses
5.09		Biotechnology and its Applications
6.01	Evolution	Evolution of Populations: Natural Selection, Hardy-Weinberg Equilibrium, Adaptive Evolution
6.02		Speciation: Reproductive Isolation, Geographical Barriers and Hybridization
6.03		Phylogeny
7.01	Ecology	Introduction to Ecology and Geology
7.02		Population Ecology: Promise and Problems of Population Growth
7.03		Community Ecology: Interactions, Disturbances and Biogeographic Factors
7.04		Ecosystems, Restoration Ecology and Conservation Biology
8.01	Biosystematics	Bacteria, Archaea and Protists
8.02		Plant Diversity I: Bryophytes
8.03		Plant Diversity II: Ferns
8.04		Plant Diversity III: Gymnosperms
8.05		Plant Diversity IV: Angiosperms
8.06		Animal Diversity I: Body Plans and the Phylum Porifera
8.07		Animal Diversity II: Phylum Cnidaria and Phylum Platyhelminthes I
8.08		Animal Diversity III: Phylum Platyhelminthes II and Phylum Nematoda
8.09		Animal Diversity IV: Phylum Mollusca
8.10		Animal Diversity V: Phylum Annelida
8.11		Animal Diversity VI: Phylum Echinodermata
8.12		Animal Diversity VII: Phylum Arthropoda
9.01	Biostatistics	Tackling Complex Graph-Based Questions in the Biology Olympiads