



# SUBJECT: BIOLOGY

## Key Stage 5 Curriculum Content

	<u>Year 12</u>	<u>YEAR 13</u>
<u>HT1</u>	<p><u>Module 1: Development of practical skills incorporated throughout the academic year.</u></p> <p><u>Module 2: Foundations in Biology:</u></p> <ul style="list-style-type: none"> <li>● Microscopy; Magnification &amp; Calibration.</li> <li>● Eukaryotic cell structure; Ultrastructure of plant cells; Prokaryotic &amp; Eukaryotic Cells.</li> <li>● Structure &amp; function of membranes; Factors affecting membrane structure; Diffusion.</li> <li>● Active Transport; Osmosis.</li> <li>● Cell cycle; Mitosis; Meiosis</li> <li>● Organisation &amp; specialisation of cells; Stem Cells</li> </ul>	<p><u>Module 6: Genetics, evolution &amp; ecosystems:</u></p> <ul style="list-style-type: none"> <li>● Ecosystems; Biomass transfer; Recycling in an ecosystem.</li> <li>● Succession; Measuring the distribution &amp; abundance of organisms; Population size.</li> <li>● Competition; Predator-prey relationships; Conservation &amp; Preservation.</li> <li>● Sustainability; Ecosystem management- Masai Mara &amp; Terai region of Nepal.</li> <li>● Ecosystem management-peat bogs; Environmentally sensitive ecosystems</li> </ul> <p><u>Module 5: Communication, homeostasis &amp; energy:</u></p> <ul style="list-style-type: none"> <li>● Coordination; Neurones</li> <li>● Sensory receptors; Nervous transmission; Synapses</li> </ul>
<u>HT2</u>	<p><u>Module 2: Foundations in Biology:</u></p> <ul style="list-style-type: none"> <li>● Biological elements; Water; Carbohydrates; Testing for Carbohydrates</li> <li>● Lipids; Structure of proteins; Types of proteins</li> <li>● Nucleic acids; DNA replication; Protein Synthesis</li> </ul>	<p><u>Module 5: Communication, homeostasis &amp; energy:</u></p> <ul style="list-style-type: none"> <li>● Nervous system; Brain; Reflexes.</li> <li>● Muscles; Sliding filament model; Hormonal communication.</li> <li>● Pancreas; Blood glucose; Diabetes.</li> <li>● Coordinated responses; controlling heart rate.</li> </ul>

	<ul style="list-style-type: none"> <li>● ATP; Enzyme action</li> <li>● Factors affecting enzyme activity</li> <li>● Enzyme inhibitors; Cofactors, coenzymes &amp; prosthetic groups</li> </ul>	<ul style="list-style-type: none"> <li>● Homeostasis; ectotherms; endotherms; excretion- liver.</li> <li>● Kidney; Osmoregulation; Urine &amp; diagnosis.</li> <li>● Kidney failure; Plant hormones &amp; growth in plants; plant responses to abiotic stress; herbivory.</li> </ul>
<u>HT3</u>	<u>Module 3: Exchange &amp; Transport:</u> <ul style="list-style-type: none"> <li>● Specialised exchange surfaces; Mammalian gaseous exchange system</li> <li>● Ventilation &amp; gas exchange in other organisms.</li> <li>● Transport systems in multicellular animals; Blood vessels.</li> <li>● Heart; Blood, tissue fluid &amp; lymph; Transport of oxygen &amp; carbon dioxide in the blood.</li> </ul>	<u>Module 5: Communication, homeostasis &amp; energy:</u> <ul style="list-style-type: none"> <li>● Tropisms; commercial use of plant hormones.</li> <li>● Energy cycles; ATP synthesis; Photosynthesis; Factors affecting photosynthesis.</li> <li>● Glycolysis; Krebs cycle; oxidative phosphorylation.</li> <li>● Anaerobic respiration; respiratory substrates.</li> </ul> <u>Module 6: Genetics, evolution &amp; ecosystems:</u> <ul style="list-style-type: none"> <li>● Mutations &amp; variation.</li> <li>● Control of gene expression; body plans; variation &amp; inheritance.</li> </ul>
<u>HT4</u>	<u>Module 3: Exchange &amp; Transport &amp; Module 4: Biodiversity, evolution &amp; disease:</u> <ul style="list-style-type: none"> <li>● Transport systems in dicotyledonous plants; Water transport in multicellular plants; Transpiration; Translocation; Plant adaptations.</li> <li>● Classification; Five kingdoms; Phylogeny; Evidence for evolution.</li> <li>● Types of variation; Representing variation graphically; Adaptations;</li> </ul>	<u>Module 6: Genetics, evolution &amp; ecosystems:</u> <ul style="list-style-type: none"> <li>● Monogenic inheritance; Di hybrid inheritance; phenotypic ratios.</li> <li>● Evolution; Speciation &amp; artificial selection; DNA profiling.</li> <li>● DNA sequencing &amp; analysis; Using DNA sequencing; Genetic engineering; Gene technology &amp; ethics.</li> </ul>

	<p>Changing population characteristics.</p> <ul style="list-style-type: none"> <li>● Animal &amp; plant pathogens; Animal &amp; plant diseases; Transmission of communicable diseases.</li> <li>● Plant defences against pathogens; Non-specific animal defences against diseases.</li> <li>● Specific immune system; Preventing &amp; treating disease.</li> </ul>	<ul style="list-style-type: none"> <li>● Natural cloning in plants; artificial cloning in plants; cloning in animals.</li> <li>● Microorganisms &amp; biotechnology; Microorganisms, medicines &amp; bioremediation; Culturing microorganisms in the laboratory.</li> <li>● Culturing microorganisms on an industrial scale; Using immobilised enzymes.</li> </ul>
<u>HT5</u>	<p><u>Module 4: Biodiversity, evolution &amp; disease:</u></p> <ul style="list-style-type: none"> <li>● Biodiversity; Sampling; Sampling Techniques</li> <li>● Calculating biodiversity; Calculating genetic biodiversity</li> <li>● Factors affecting biodiversity; Reasons for maintaining biodiversity; Methods for maintaining biodiversity.</li> </ul> <p>Content revision of Module 1, 2, 3 &amp; 4.</p>	<u>Content revision of Module 1, 2, 3, 4, 5 &amp; 6.</u>
<u>HT6</u>	<p><u>Content revision of Module 1, 2, 3 &amp; 4.</u></p> <p><u>Module 1: Development of practical skills:</u></p> <p>Completion of Practical Activity Groups 1-12.</p>	<u>Content revision of Module 1, 2, 3, 4, 5 &amp; 6.</u>