

Compulsory Concepts (Second Year of Cycle Two)

The Living World	The Material World	The Earth And Space	The Technological World
<p>ECOLOGY</p> <ul style="list-style-type: none"> - Study of populations (density, biological cycles) - Dynamics of communities <ul style="list-style-type: none"> • Biodiversity • Disturbances - Dynamics of ecosystems <ul style="list-style-type: none"> • Trophic relationships • Primary productivity • Material and energy flow • Chemical recycling 	<p>PHYSICAL PROPERTIES OF SOLUTIONS</p> <ul style="list-style-type: none"> - Concentration (ppm) - Electrolytes - pH scale - Electrolytic dissociation - Ions - Electrical conductivity <p>CHEMICAL CHANGES</p> <ul style="list-style-type: none"> - Combustion - Photosynthesis and respiration - Acid-base neutralization reaction - Balancing chemical equations - Law of conservation of mass <p>ORGANIZATION OF MATTER</p> <ul style="list-style-type: none"> - Rutherford-Bohr atomic model - Lewis notation <p>ELECTRICITY AND ELECTROMAGNETISM</p> <p><i>Electricity</i></p> <ul style="list-style-type: none"> - Electrical charge - Static electricity - Ohm's law - Electrical circuits - Relationship between power and electrical energy <p><i>Electromagnetism</i></p> <ul style="list-style-type: none"> - Forces of attraction and repulsion - Magnetic field of a live wire <p>TRANSFORMATION OF ENERGY</p> <ul style="list-style-type: none"> - Law of conservation of energy - Energy efficiency - Distinction between heat and temperature 	<p>BIOGEOCHEMICAL CYCLES</p> <ul style="list-style-type: none"> - Carbon cycle - Nitrogen cycle <p>CLIMATE ZONES</p> <ul style="list-style-type: none"> - Factors that influence the distribution of biomes - Marine biomes - Terrestrial biomes <p>LITHOSPHERE</p> <ul style="list-style-type: none"> - Minerals - Soil profile (horizons) - Permafrost - Energy resources <p>HYDROSPHERE</p> <ul style="list-style-type: none"> - Catchment area - Oceanic circulation - Glacier and ice floe - Salinity - Energy resources <p>ATMOSPHERE</p> <ul style="list-style-type: none"> - Green house effect - Atmospheric circulation - Air mass - Cyclone and anticyclone - Energy resources <p>SPACE</p> <ul style="list-style-type: none"> - Solar energy flow - Earth-Moon system (gravitational effect) 	<p>MECHANICAL ENGINEERING</p> <ul style="list-style-type: none"> - Characteristics of linking mechanical parts - Guiding controls - Construction and characteristics of motion transmission systems (friction gears, pulleys and belt, gear assembly, sprocket wheels and chain, worm and worm gear) - Speed changes - Construction and characteristics of motion transformation systems (screw gear system, cams, connecting rods, cranks, slides, rotating slider crank mechanisms, rack-and-pinion drive) <p>ELECTRICAL ENGINEERING</p> <ul style="list-style-type: none"> - Power supply - Conduction, insulation, and protection - Control - Transformation of energy (electricity and light, heat, vibration, magnetism) <p>MATERIALS</p> <ul style="list-style-type: none"> - Constraints (deflection, shearing) - Characteristics of mechanical properties - Types and properties <ul style="list-style-type: none"> • Plastics (thermoplastics, thermosetting plastics) • Ceramics • Composites - Modification of properties (degradation, protection)