CSEC BIOLOGY
SYLLABUS SUMMARY

A. Living Organisms In the Environment

1. Characteristics of Living Organisms
- Classification of organisms

2. Ecological Study and Sampling methods
- Ecosystem, abiotic and biotic factors
- Components and importance of soil

3. Feeding and Special Relationships in Ecosystems
- Food chains, food webs, trophic levels, energy flow
- Symbiotic Relationships
- Nutrient cycling (carbon and nitrogen cycles)

4. Impact of Human Activities on Environment
- Natural Resources and Recycling
- Pollution and conservation

B. Life Processes and Disease

1. Cells, Osmosis and Diffusion
- Cell structure and function (plants, animals, bacteria, amoeba)
- Cell specialization and organization in multicellular organisms
- Osmosis, diffusion and active transport

2. Nutrition
- In plants: photosynthesis, structure of leaf, minerals needed by plants
- In humans: nutrients, food tests, digestive system, tooth structure, importance of enzymes, balanced diet,

3. Respiration and Gaseous Exchange
- Aerobic and anaerobic respiration
- The respiratory system, breathing
- Gaseous exchange in humans, fish, plants
- Effects of cigarette smoking

4. Transport in Animals and Plants
- The need for a transport system in multicellular organisms
- The human circulatory system (blood, heart, vessels, blood clotting, immunity)
- Structure and function of xylem and phloem
- Transpiration and food storage

5. Excretion and Osmoregulation
   - Excretory organs and products
   - Kidney and nephron structure and function
   - Osmoregulation in human and water conservation in plants

6. Movement and Support (skeleton, bones, joints, muscles)

   Sensitivity and Coordination
   - Stimulus and Response in plants and invertebrates
   - Nervous system, neurons, reflex pathway, brain structure
   - Drug use
   - Structure of the eye and the skin

7. Growth and Reproduction
   - Measuring growth
   - Sexual/asexual reproduction (male and female reproductive systems)
   - Menstrual cycle, fertilization and pregnancy, birth control
   - Reproduction in flowering plants, structure of seed, germination, seed/fruit dispersal

8. Disease, Treatment and Control
   - Types of diseases, role of vectors,
   - Transmission of HIV/AIDS, gonorrhea,
   - Social and economic implications of disease in plants and animals

C. Continuity and Variation

1. Cell division (Mitosis and meiosis)
2. Genetic & Environmental variation (continuous and discontinuous variation)
3. Inheritance (DNA, RNA, chromosomes, genes, inheriting a single pair of characteristics, genetic diagrams e.g. Punnett square)
4. Biological species, natural and artificial selection
5. Genetic engineering

Exam Format (Three papers)

- Paper 1 (60 multiple choice questions) [1 hr and 15 mins]
- Paper 2 (6 questions- One investigative/experimental; two structured, and three essay-type) [2 hrs 30 mins]
- * Paper 3/2 (SBA alternative paper consists of THREE experimental based questions for private candidates sitting exam outside of a school/continuing education program) [2 hrs and 10 mins]