ST. MARY'S COLLEGE

CAPE BIOLOGY UNIT 1

Course Outline

Term 1

Unit/ Section	Topic	Modules	Week
01	Biochemistry	**Water**	**1**
		:01 – structure and properties of water	
		Carbohydrates	**2-3**
		:02- structure and function of glucose and relationship to sucrose	
		:03 –structure and function of starch, glycogen and cellulose and relationship in living organisms	
		Lipids	**4**
		:04- molecular structure of triglycerides and function	
		Proteins	**5-6**
		:05- structure of amino acids and peptide bond formation	
		:06-formation of primary, secondary, tertiary and quaternary structure	
		:07-molecular formation of haemoglobin and collagen	
		-Conducting various food tests -Determination of sucrose content in unknown drink sample ***- Determination of sucrose content in sample drinks from cafeteria (research project) (p&D, A&I)*** **-** Determination of protein content in commercial whey protein powder samples	
7-802	Cell structure	:01- drawings of typical animal and plant cells under microscope and related organelles	**7-8**
		- **-** Drawing of plant cells	
		:02- structure and function of cell membrane; transport across the membrane	
		Determination of water potential in plant cells using the weighing method (SBA: ORR and A&I)	
		:03-function of organelles in both animal and plant cells	
		:04- structure and function of prokaryotic and eukaryotic cells	
		:05-Concepts of tissues and organs	
		-Drawing of plant dicotyledonous root	

		- ***Drawing of the transverse section of the dicotyledonous leaf (M&M)*** - Electron micrographs of plant tissues - ***Creation of onion tissue slide (M&M)***	
03	**Enzymes**	:01- structure of ensymes and catalase metabolic reactions	**9**
		:02- mode of enzyme activity	
		:03- factors affecting enzyme activity	
		-Effect of enzyme concentration on rates of reaction (SBA: ORR) - Effect of enzymes on substrate concentration	
		:04- role of inhibitors	
		Browning process in avocado (P&D)	
04	**Nucleic acids/Protein formation**	:01- structure and role of DNA and RNA	**10-11**
		:02 – relationship between nucleotides and amino acid sequence in polypeptides	
		:03 – role of DNA and RNA in protein synthesis	
		:04 – implications of changes in DNA in Sickle cell anaemia and PKU	
05	**Mitosis and Meiosis**	:01- description of diagrams of mitotic cell division	**12**
		Drawings of stages of mitosis in the root tip	
		:02-importance of replication and genetic stability	
		:03- homologous pairing and terms diploid and haploid	
		:04- description of diagrams of meiotic cell division and how	
		Building models of the stages of meiosis	
		:05- describe how meiosis contributes to heritable variation	

Term 2

Unit/Section	Topic	Modules	
01	**Reproduction in plants**	:01-advantages and dsadvantages of sexual and asexual reproduction to the species	**1-2**
		:02- structure of the anther and pollen grain formation	
		Drawing of the Anther (DRAW)	
		:03- structure of ovary and ovule and formation of embryo sac	
		Drawing of the ovary (Graafian Follicle) (DRAW)	
		:04- self and cross pollination	
		:05- events from pollination to seed formation	

		Drawing of the female ovary in plants	
		:06- consequences of asexual and sexual reproduction	
02	**Reproduction in man**	:01-structure and function of female and male reproductive system	**3-4**
		:02-gametogenesis in male and females	
		Drawing of the testis	
		:03-importance of hormones in the menstrual cycle	
		:04-implantation and development of the foetus	
		:05- structure and function of the placenta	
		:06- structure and function of the amnion and the effects of maternal behavior on foetal development	

Unit/Section	Topic	Modules	
03	**Patterns of Inheritance**		
		:01 – explain terms gene, allele, dominant, recessive, codominant, homozygous and heterozygous	**5**
		:02 – genetic diagrams	
		:03 – chi- square test and relevance of results	
04	**Variation and natural selection**	:01- description of gene and chromosomes	**6-7**
		:02- relevance of mutations to genetic variation	
		:03- environmental factors that lead to natural selection	
		:04- natural selection and evolution	
		:05- concepts of species and speciation	
05	**Genetic engineering**	:01- use of restriction enzymes	**8-9**
		:02- recombinant DNA technology	
		:03- gene therapy	
		:04- implications of genetically modified organisms on humabs and society	

.