2011/12 Batch
Foundation Module - Year 1

FINAL document - Revised on 08th April, 2013

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Topic	Objectives	Time	Dept.	T/ L Activity
	At the end of the overview, the student should be able to;			
2011-1/SBM-1/1				
Health				
Introduction to health and determinants of health (Assignments)		1h	Community Medicine	Introductory Lecture and Student Assignment
	1. define the term health and identify the role and the responsibility of a doctor in sustaining health.	3h	Community Medicine	3x1h SGD Student Assignments
	2. describe the evolutionary process of health care to understand the current concept of health.			
	3. effects of biological and environmental factors on health.			
	4. describe the organizational structure of preventive and curative health care services provided by the government and other health care services in Sri Lanka.			
	5. explain the effects of lifestyle and psychological factors on health.			
	6. describe the effects of socioeconomic and demographic factors on health.			
	7. identify the responsible persons or institutions in Sri Lanka to ensure the health of people.			
	8. identify the methods and techniques used to evaluate the health of a community, describe how the countries are classified using the health indices.			
	Presentation of student assignments	3h	Community Medicine	Seminar / presentation of Student assignments
2011-1/SBM-1/2				
Overview	understand,	1h	Anatomy	Lecture
a. Introduction to Anatomy	1. the importance of studying human anatomy			
	2. that the study of the structure of the body is facilitated by dividing it in to subsections			
	3. anatomical nomenclature			

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b. The multicellular organism	1. understand the levels of organization of the multicellular organism from cells, tissues, organs and systems and their integration in to human being 2. understand the terms “totipotent” and “pluripotent “ 3. understand that the functional unit of the multicellular organism is the tissue 4. state the basic systems of the body and their functions	1h	Anatomy	Lecture
c. Microscopy	1. identify the parts of the light microscope 2. handle the light microscope and state its uses 3. calculate the magnification 4. name the other microscopes and their uses (phase contrast, fluorescent, canning, transmission electron microscopes)	1h	Anatomy	Lecture
2011-1/SBM-1/3				
The cell				
Structure and microscopic appearance	describe, 1. the basic structure of the prokaryotic and eukaryotic cell 2. be able to describe the electron microscopic appearance of a normal eukaryotic cell 3. be able to understand that there are different types and size of cells (squamous, cuboidal, columnar)	3h	Anatomy	1h - Lecture 2h - PD
2011-1/SBM-1/4				
Cell Basics				
	describe the fundamental unit of life (cell) 1. describe the basic structure of the cell including the ultra-structure 2. describe the basic functions of the cell organelles and the membrane	2h	Anatomy, Biochemistry, Medicine	Staff Seminar
2011-1/SBM-1/5				
Cell organelles	1. understand the basis of separation of cell organelles 2. recognise the markers of identification of cell organelles	3h	PD	Biochemistry
a. Membrane	describe the basic structure & functions of the cell membrane	1h	Biochemistry	Lecture
b. Biomolecules	briefly describe the biomolecules (carbohydrates, amino acids, proteins, lipids,) of the cell and their importance in cellular function	10h	Biochemistry	Lecture demo(4h) +PD (6h)

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2011-1/SBM-1/6				
Enzymes	1. describe what an enzyme is and the functions of enzymes in the body		Biochemistry	Lecture demonstration
	2. explain that enzymes are globular proteins which catalyse biological reactions.			
	3. explain the mode of action of enzymes in terms of an active site, enzyme/substrate complex, lowering of activation energy and enzyme specificity.			
	4. describe and explain the effects of pH, temperature, enzyme concentration and substrate concentration on enzyme action.			
	5. follow the time course of an enzyme-catalysed reaction, by measuring rates of formation of products (for example using catalase) or rate of disappearance of substrate (for example using amylase).	8h	Biochemistry	Lecture (2h), PD (6h)
	6. investigate the effects of temperature, pH, enzyme concentration and substrate concentration on the rate of enzyme-catalysed reactions, and explain these effects.			
	7. explain the effects of competitive and non-competitive inhibitors on the rate of enzyme activity.			
	8. describe the role of allosteric enzymes and isozymes.			
	9. use the knowledge gained in this section in new situations or to solve related problems.			
2011-1/SBM-1/7				
a. Regulation of enzyme activity	1. Illustrate the different ways in which activity of existing enzymes could be regulated, citing examples.			
	2. recognize that most regulatory enzymes are allosteric.			
	3. explain how allosteric modulators regulate enzyme activity.			
	4. recall the regulatory functions of the following; hexokinase, glucose 6-phosphatase, phosphofructokinase, fructose diphosphatase, pyruvate dehydrogenase, pyruvate carboxylase, citrate synthase and isocitrate dehydrogenase, acetyl CoA carboxylase, HMG CoA reductase, aspartate carbamoyl transferase and phosphoribosyl pyrophosphate amino transferase.	1h	Biochemistry	Lecture
	5. explain how the activity of an enzyme could be regulated by covalent changes in its molecule.			
	SBM-1/6 & SBM-1/7	2h	Biochemistry	SGD

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b. Energy for the cell	1. state the need for energy for cellular activity 2. identify the mode of energy production	1h	Biochemistry	Lecture Discussion
2011-1/SBM-1/8				
Energy for the cell				
a. Glycolysis	1. recognise that glycolysis is an universal pathway			
	2. outline the glycolytic pathway and its rate limiting steps			Lecture(1h)
	3. identify the reaction where substrate level phosphorylation occurs			
	4. differentiate between aerobic and anaerobic glycolysis			
b. HMP Shunt	1. explain the role of the HMP shunt in different cells			
	2. outline the pathway and its rate limiting step			Lecture(1h)
	3. list the tissues that have an active HMP Shunt and explain the need for it to be active.			
	4. explain why it is considered as a shunt?			
c. TCA Cycle	1. list in sequence the enzymes and co enzymes of the TCA cycle.			
	2. recognise that it is a key pathway for integration of various metabolic pathways			Lecture(1h)
	3. explain the amphibolic role of the pathway (plays a role in both oxidative and synthetic pathways)			
	4. explain how the pathway is regulated			
	5. describe the entry of fatty acids, pyruvate and amino acids into the TCA cycle.	10h	Biochemistry	
d. Electron transport chain	1. state the function of the electron transport chain.			
	2. describe the components of the chain			Lecture(1h)
	3. describe how ATP is generated during electron transport.			
	4. state the final electron acceptor and the end product formed at the end of aerobic respiration.			
e. Oxidation of fatty acids, ketone bodies & amino acids	1. outline the main events taking place during oxidation of fatty acids			
	2. recognise that fat produce more energy upon oxidation compared to that of carbohydrates and proteins			
	3. describe how the oxidation of fatty acids is regulated			Lecture(1h)
	4. recognise that ketone bodies serve as a fuel for extrahepatic tissues			
	5. recognise that transamination and oxidative deamination are methods for the removal of amino groups before oxidizing the carbon skeleton.			
	6. differentiate glucogenic from ketogenic amino acids			

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	7. recognise that Ala, Asp, and Glu are the major amino acids in blood during fasting and they carry NH2 groups to the liver for disposal as urea.			
	8. state the situations where catabolism of amino acids are increased			
2011-1/SBM-1/9				
Synthetic Functions				
a. Carbohydrate	1. state what gluconeogenesis is, and explain how it differs from glycolysis.			Lecture (1h)
	2.state the rate limiting steps of gluconeogenesis and explain how they are regulated.			
	3. describe the process of glycogenesis and explain how it is regulated			Lecture (1h)
	4. outline the processes involved in the synthesis of fructose, galactose and lactose.			Lecture (1h)
b. Lipids	1. outline the process of fatty acid synthesis.			Lectute (1h)
	2. state the characteristic features of the 'fatty acyl synthase' enzyme.			
	3. state how fatty acid synthesis is regulated.	12h	Biochemistry	
	4. outline the process of cholesterol synthesis			Lecture (1h)
	5. state how mevolanate is synthesised.			
	6. state how cholesterol synthesis is regulated.			
	7. explain how ketone bodies are synthesised.			Lecture (1h)
	8. state the importance of ketone bodies in energy production.			
c. Nucleic acids	1. state the precursors of purine and pyrimidine nuclei.			Lecture (2h)
	2. describe the role of PRPP in nucleic acids synthesis			
	3. explain how the purine and pyrimidine syntheses are regulated.			
d. Cell division	1. describe mitosis and meiosis (giving examples) stating their importance	2h	Anatomy	Lecture
	2. be able to state the phases of the cell cycle			
	3. state the events that take place in the cell cycle	1h	Biochemistry	Lecture discussion
2011-1/SBM-1/10				
Tissues of the body			Anatomy	(1X3) - Lecture 2hr PD
a. Introduction to basic tissue	1. state the basic tissue types of the body, their distribution and arrangement	5h		
b. Epithelia and glandular tissue				

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c. Connective tissue	1. identify the different types of epithelial tissue, glandular tissue and connective tissue giving examples			
	2. describe the light microscopic appearance			
	3. describe how the structure of epithelial, glandular and connective tissues adapted to perform the functions			
2011-1/SBM-1/11				
Introduction to dissections	1. understand why dissections are important in	4h	Anatomy	PD (3h) + Lecture (1h)
	2. take care of the cadaver during dissections			
	3. understand the importance of pre-dissection activities such as studying the bones and living anatomy			
	4. understand the importance of implying proper method of dissection, engaging in group studies, using the cadaver, text books, atlases, skeleton, radiographs etc. in learning the structure of the body			
	5. identify the tissues encountered in dissection of the human body and their arrangement,			
2011-1/SBM-1/12				
Homeostasis				
a. Introduction to cellular homeostasis	1. state the role of hormones in metabolic regulation	1h	Biochemistry	Lecture demonstration
b. Introduction to Body Homeostasis	1. explain the term internal environment	1h	Physiology	Lecture
	2. explain the mechanisms by which the various systems of the body maintain homeostasis			
	3. explain what is meant by "feedback mechanisms"			
	4. explain giving an example, how homeostasis is disturbed			
c. Body composition, membrane transport mechanisms, fluid and electrolyte balance and pH				
i. Body composition	1. list the body fluid compartments and state the percentages of water and concentration of electrolytes in each compartment	3h	Physiology	Lecture (1h) + Practical (2h)
	2. state the composition of the body in terms of body water, lean body mass and body fat and the variations in body composition (Introduce body mass index-BMI).			
	3. State the basis percentage of fat in the body and its variations with sex and age			

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	4. State the basis of estimation of body fat from skin fold thickness			
	6. Measure skin fold thickness in common sites and determine the body fat percentage			
	7. determine BMI from anthropometric measurements and state the basis of its use as an index of obesity			
ii. Membrane transport	explain cell membrane structure and permeability characteristics with reference to simple diffusion, facilitated diffusion, active transport, phagocytosis and pinocytosis, osmosis	2h	Physiology	Lecture
iii. Ion channels	describe the functions of ion channels and transport proteins and explain how contribute to selective permeability of the plasma membrane	1h	Physiology	Lecture
iv. Fluid balance	1. list the routes of fluid intake and output and recognise that in health, intake equals output	5h	Biochemistry	CCR
	2. Explain the normal variations and clinical situations where the fluid intake is not equal to output			
v. Acid base balance	understand the basic principles of acid-base balance and maintenance of blood pH	1h	Biochemistry	Lecture demonstration
vi. Disposal of cell waste	explain the mechanisms of disposal of cell waste (water-soluble and water-insoluble)	1h	Biochemistry	Lecture
vii. Disposal of nitrogenous waste			Biochemistry	Lectures (4h), Practical (3h)
viii. Urea cycle & regulation, Uric acid, Creatinine	1. explain the modifications needed to be made prior to excretion of a substance	1h		
	2. list the biomolecules whose catabolism leads to the formation of nitrogenous waste.			
	3. state the role of transamination and oxidative deamination in the removal of amino nitrogen.			
	4. describe the importance of urea cycle in excretion of N waste.	1h		
	5. describe the urea synthesis pathway and its regulation			
	6. explain how nucleic acids are catabolised	1h		
	7. state how the catabolism is regulated			
	8. state the precursors and function of creatine phosphate	1h		
	9. state why creatinine excretion is obligatory			
	10. state how sulphur is excreted			

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2011-1/SBM-1/13				
Excitable tissues & resting membrane potential	1. explain why some membranes are excitable 2. describe the electrochemical basis of resting membrane potential.	2h	Physiology	Lecture
2011-1/SBM-1/14				
Typical spinal nerve	1. state the component parts of a typical spinal nerve 2. state the area of supply of the anterior and posterior primary rami	1h	Anatomy	Lecture
2011-1/SBM-1/15				
Action potential	1. describe the mechanism of generation and propagation of action potential 2. explain the diffrences in action potentials of skeletal, smooth and cardiac muscles	2 h	Physiology	Lecture
2011-1/SBM-1/16				
Autonomic Nervous System	1. compare and contrast the sympathetic and parasympathetic NS in terms of; outflow from the CNS/ pre-ganglionic and postganglionic fibres/ neurotransmitters/ receptors/ simulatory and inhibitory actions of different organs/ stimulatory and inhibitory drugs that act on the autonomic receptors	2 h	Physiology	Lecture
2011-1/SBM-1/17				
Early embryogenesis	describe 1. the male and female germ cells and their origin 2. the cyclical changes in the endometrium after puberty 3. fertilization and factors affecting fertilization 4. implantation and factors affecting implantation 5. the process from fertilized ovum to germ layer formation 6. state the basic tissues derived from the germ layers 7. formation of the neural tube, neural crest cells and their derivatives 8. the development of pharyngeal arches 9. the development of the limb buds 10. introduction to congenital abnormalities and twinning	5h	Anatomy	Lectures
2011-1/SBM-1/18				
Human Genetics				
a. Introduction	Overview of the following 1. briefly describe the theories on the origin of life 2. understand the importance of protein molecules in cellular functions and maintaining the structure , 3. state how genetic material store information of the amino acid sequence of a polypeptide	1h	Anatomy	Lectures (1hx2)

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	4. state how the information is transferred to the next generation			
	5. describe arrangement of genetic material in prokaryotic and eukaryotic cells			
	6. be able to state the importance of studying genetics and a brief history			
	7. be able to describe polymorphism, alleles, heterozygous, homozygous, dominant, recessive.....			
b. Chromosomes	1. describe the basic structure and classification of chromosomes	2h	Anatomy	Lecture
	2. understand what is meant by Ploidy , diploid, haploid , aneuploidy, trisomy, monosomy ...			
	3. describe the normal karyotype and karyotyping			
	4. describe chromosomal abnormalities and their consequences			
c. Nucleic acids and genes	1. describe the structure & function of nucleic acids	2h	Biochemistrty	Lectures
	1.1. define 'gene'			
	1.2. state the role of genes in the body			
	1.3. state what is gene expression			
d. Inheritance	1 explain what is meant by a Pedigree	3h	Anatomy	Lecture(1h) , 2h- PD
	2. identify the symbols used in a Pedigree			
	3. construct a Pedigree			
	4. analyse and interpret a Pedigree			
	5. describe the term Mendelian Inheritance using examples	2h		Lecture
	6. describe the term polygenic inheritance using examples	1h		Lecture
2011-1/SBM-1/19				
Human evolution	describe the evolution of man	1h	Anatomy	Lecture
2011-1/SBM-1/20				
Free radicals and Antioxidants	1. define a free radical.	2h	Biochemistry	Lectures
	2. explain how free radicals are formed in the body.			
	3. state the effect of free radicals on biomolecules			
	4. describe how free radicals lead to ill health			
	5. explain what an antioxidant is			
	6. list the substances that act as antioxidants			
	7. describe giving examples, how antioxidants counteract the effects of free radicals			
2011-1/SBM-1/21				
Basic Statistics	Introduction to statistics	1h	Com. Med.	Lecture

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2011-1/SBM-1/22				
Scientific Thinking				
a. Scientific Thinking	1. describe key features of scientific knowledge system in relation to generation of new knowledge and validation of generated knowledge including, methods of knowledge dissemination. (Link – compare with other knowledge systems)	2h	MEU to Co-ordinate	Lecture
	2. demonstrate an understanding of the importance of scientific attitude within doctor when it comes to patient care.	1h		Lecture
b. Systems of generating knowledge	1. give examples of different knowledge systems which influence the thinking and behavior of individuals in relation to health and illness.	1h		Lecture
	2. describe how 'scientific' system of knowledge differs from other knowledge systems.			
	3. describe the limitations of 'scientific' knowledge system and, explain why the 'scientific' system of knowledge is currently preferred over other knowledge systems.			
	4. describe the concept of 'Hierarchy of Sciences' and state disciplines which are relevant to study of Medicine.			
c. Finding and solving problems in the community (community case study)	Finding and solving problems in the community (community case study)	2h	Community Medicine	Task oriented Lecture
	At the end of the overview, using an example, the student should be able to			
	1. identify the methods used to collect data to evaluate the health status of people			
	2. state how the collected data will be utilized to arrive at a conclusion			
	3. identify the basic strategies to solve the identified problem			
2011-1/SBM-1/23				
Introduction to Imaging	to know the basic different imaging modalities and the basic principles of them	1h	Radiology	Lecture

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