

HOWARD UNIVERSITY  
 COLLEGE of ARTS and SCIENCES  
 COMPREHENSIVE SCIENCES

LIFE SCIENCES LECTURE TIMELINE  
 Fall 2017

<u>WEEK(S)</u>	<u>LECTURE TOPIC(S)</u>	<u>TEXTBOOK CHAPTERS</u>
August 22 <sup>nd</sup> -24 <sup>th</sup>	SCIENTIFIC CONCEPTS, IDEAS, and METHODS -- THE DERIVATION of EMPIRICAL KNOWLEDGE INTRODUCTION TO SCIENCE  - definition of science – Science is a systematized investigation of unknown factors which is based on evidence/facts. - scientific methodology – steps to <u>PROVE</u> or <u>DISPROVE</u> The HYPOTHESIS. - types/categories of sciences (natural, political, social, etc.) - the natural sciences (biological and physical) - subject areas of the biological sciences (microbiology, zoology, botany) - scientists and scientific ideas - contributions of African American scientists - IMPORTANT TOPICS: * SCIENTIFIC METHODOLOGY and SCIENCE CONCEPTS * EMPIRICAL DATA AND FACTS * THE IMPACT OF SCIENCE ON ETHICAL, LEGAL, SOCIAL ISSUES * SCIENCE and PUBLIC POLICY * CHARACTERISTICS of SCIENTIFIC DISCIPLINES	Chapter 1.5  Chapter 1.6-9
August 28 <sup>th</sup> -31 <sup>st</sup>	LIFE  - definition – Life is a series of dynamic interacting processes and/or events. - basic characteristics common to all life forms: (1) composed of organic molecules (2) exhibit a metabolism – create and/or use chemical energy (3) reproduce – transfer DNA to another generation via asexual or sexual reproductive mechanisms (4) evolution – trace to ancestors - survey of the diversity of life forms from each of the five Kingdoms (Monera, Protista, Fungi, Plantae, Animalia)	Chapter 1.1-3

<u>WEEK(S)</u>	<u>LECTURE TOPICS</u>	<u>TEXTBOOK CHAPTERS</u>
September 5 <sup>th</sup> -7 <sup>th</sup> <b>UNIT II: TAXONOMY</b>	SCIENTIFIC CLASSIFICATION and NAMING of all LIFE FORMS - definition of taxonomy - Linneaus system of classification - survey of distinguishing/distinctive characteristics of organisms in the Kingdoms of Life - IMPORTANT TOPICS: * TEN (10) MILLION SPECIES of LIFE FORMS – EVOLVED OVER FOUR and ONE-HALF (4.5) BILLION YEARS * BIODIVERSITY – bacteria, protozoa, fungi, plants, animals * FREE-LIVING LIFE FORMS * PARASITIC LIFE FORMS * PATHOGENIC LIFE FORMS * SCIENTIFIC vs COMMON NAMES * SPECIES NAMED for POPULAR PERSONALITIES	Chapter 1.4  Chapter 19 (pp. 320-323) bacteria Chapter 20 (pp. 331-341) protozoa Chapter 21 - plants Chapter 22 - fungi Chapter 23 - invertebrates Chapter 24 - vertebrates
September 12 <sup>th</sup> -21 <sup>st</sup> <b>UNIT III: STRUCTURE and PHYSIOLOGY</b>	THE PHYSICAL and CHEMICAL (Molecular) COMPOSITION of LIFE and STRUCTURE and PHYSIOLOGY of ALL FORMS of LIFE (simple, complex; bacteria, protozoa, fungi, plants, animals) - all living organisms have a structure(s) – shape (morphology), size, anatomy, and multiple functions (physiologies) - organisms may be unicellular or multicellular - living organisms may be examined on <u>levels of organization</u> (molecular, microscopic and macroscopic) - levels of organization of life forms (quarks and atoms, elements, macromolecules and sub-units, cells and organelles, tissues, organs, systems)  MOLECULAR LEVEL - quarks and atoms - chemical bonds - elements and molecules - unit (small) molecules of life - inorganic (elements and molecules) - water, acids, bases, salts, buffers - organic/contain carbon - monomer sub-units - saccharides - amino acids - fatty acids + glycerol - nucleotides - macromolecules (structure and function(s)) - carbohydrates, proteins, lipids, nucleic Acids (RNA, DNA), summary	Appendix I- periodic table Appendix II – Molecular Models Chapter 2 Chapter 3

<u>WEEK(S)</u>	<u>LECTURE TOPICS</u>	<u>TEXTBOOK CHAPTERS</u>
September 12 <sup>th</sup> -21 <sup>st</sup>	<p>MICROSCOPIC LEVEL (cells, tissues)</p> <ul style="list-style-type: none"> <li>- cells</li> <li>- summary</li> <li>- basic structure and function</li> <li>- eukaryotic cells</li> <li>- cell organelles</li> <li>- nucleus, cytoplasm, cell membrane, ribosomes, mitochondria, Golgi body, endoplasmic reticulum, vacuole, chloroplasts, cell wall, centrioles, nucleolus</li> <li>- prokaryotic cells</li> <li>- tissues</li> <li>- plant (ground, vascular, dermal)</li> <li>- animal (epithelial, connective, muscle, nervous)</li> </ul> <p>MACROSCOPIC/GROSS LEVEL</p> <ul style="list-style-type: none"> <li>- unicellular and multicellular individuals</li> <li>- organs and organ systems <ul style="list-style-type: none"> <li>- plant organ systems (shoot, root) <ul style="list-style-type: none"> <li>- organs <ul style="list-style-type: none"> <li>- leaf</li> <li>- stem</li> <li>- root</li> </ul> </li> </ul> </li> <li>- animal organ systems <ul style="list-style-type: none"> <li>- overview</li> <li>- integumentary, muscular, skeletal, nervous, endocrine, circulatory, lymphatic, respiratory, digestive, urinary/excretory, reproductive</li> <li>- integumentary</li> <li>- muscular</li> <li>- skeletal (exo-, endo-)</li> <li>- nervous</li> <li>- endocrine</li> <li>- circulatory</li> <li>- lymphatic</li> <li>- respiratory</li> <li>- digestive</li> <li>- urinary/excretory</li> <li>- reproductive</li> </ul> </li> </ul> </li> </ul> <p>IMPORTANT TOPICS:</p> <ul style="list-style-type: none"> <li>* STEM CELL RESEARCH</li> <li>* TISSUE CULTURE</li> <li>* HeLa CELL LINE</li> <li>* CANCER CELLS</li> <li>* ORGAN TRANSPLANTS</li> <li>* AUTOPSIES/ANATOMY DISSECTION</li> <li>* PLANT GRAFTS</li> </ul>	<p>Chapter 4</p> <p>Chapter 25 - plants</p> <p>Chapter 28 - animals</p> <p>Chapter 28 pp. 448-449</p>

**EXAMINATION I - Units I, II, III**