Korea University International Summer Campus (KU ISC) 2022

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June 28, 2022 ~ August 4, 2022

ISC105 – General Biology

Ⅰ. Instructor

Professor	:	Dr. Chu-Young Kim
E-mail	:	ckim7@utep.edu
Home Institution	:	The University of Texas at El Paso
Class Time	:	10:30~12:10 KST
Office	:	To be determined
Office Hours	:	To be determined

Ⅱ. Textbook

Required Textbook	:	**Campbell Biology, 12th Edition**; Urry, Cain, Wasserman, Minorsky, Reece; Pearson Education (ISBN-13: 9780135188743) https://www.pearson.com/us/higher-education/product/Urry-Campbell-Biology-RENTAL-EDITION-12th-Edition/9780135188743.html You can purchase the electronic version or rent a hardcopy from Pearson. https://www.pearson.com/us/higher-education/program/Urry-Modified-Mastering-Biology-with-Pearson-e-Text-Access-Card-for-Campbell-Biology-12th-Edition/PGM2842336.html?tab=order Note: Campbell Biology, 11th Edition is also ok (in case you want to purchase a used textbook).

Ⅲ. Course Description and Objectives

ISC105 - General Biology I is designed to provide foundation knowledge for students majoring in biology. This course is also appropriate for physical science, health science, and engineering students who wish to learn the fundamentals of modern biology at the college level. Emphasis of this course is placed on biomolecules and cellular structure. **This course does not have a laboratory component.**

Ⅳ. Grading

There will be a total of 19 quizzes and 3 tests. Your combined quiz score will make up 70% and your combined test score will make up 30% of your course score. Your final grade will be assigned according to the KU ISC grading scale (95–100: **A+**, 90–94: **A**, 85–89: **B+**, 80–84: **B**, 75–79: **C+**, 70–74: **C**, 65–69: **D+**, 60–64: **D**, 0–59: **F**).

V. Class Outline

Date		Lecture	Assessment
Week 1	6/28 (Tue)	Orientation Day (no class)	None
	6/29 (Wed)	**1.1** - The study of life reveals unifying themes **1.2** - The core theme: Evaluation accounts for the university and diversity of life	Quiz 1
	6/30 (Thu)	**1.3** - In the studying nature, scientists form and test hypotheses **1.4** - Science benefits from a cooperative approach and diverse viewpoints	Quiz 2
	7/01 (Fri)	**2.1** - Matter consists of chemical elements in pure form and in combinations called compounds **2.2** - An element's properties depend on the structure of its atoms	Quiz 3
Week 2	7/04 (Mon)	**2.3** - The formation and function of molecules depend on chemical bonding between atoms **2.4** - Chemical reactions make and break chemical bonds	Quiz 4
	7/05 (Tue)	**3.1** - Polar covalent bonds in water molecules result in hydrogen bonding **3.2** - Four emergent properties of water contribute to Earth's suitability for life	Quiz 5
	7/06 (Wed)	**3.3** - Acidic and basic conditions affect living organisms **4.1** - Organic chemistry is key to the origin of life	Quiz 6
	7/07 (Thu)	No lecture (test only)	Test 1
Week 3	7/11 (Mon)	**4.2** - Carbon atoms can form diverse molecules by bonding to four other atoms **4.3** - A few chemical groups are key to molecular function	Quiz 7
	7/12 (Tue)	**5.1** - Macromolecules are polymers, built from monomers **5.2** - Carbohydrates serve as fuel and building material	Quiz 8
	7/13 (Wed)	**5.3** - Lipids are a diverse group of hydrophobic molecules **5.4 -** Proteins include a diversity of structures, resulting in a wide range of functions	Quiz 9
	7/14 (Thu)	**5.5** - Nucleic acids store, transmit, and help express hereditary information **5.6** - Genomics and proteomics have transformed biological inquiry and applications	Quiz 10
Week 4	7/18 (Mon)	**6.1** - Biologists use microscopes and biochemistry to study cells **6.2** - Eukaryotic cells have internal membranes that compartmentalize their functions	Qui 11
	7/19 (Tue)	**6.3** - The eukaryotic cell's genetic instructions are housed in the nucleus and carried out by the ribosomes **6.4** - The endomembrane system regulates protein traffic and performs metabolic functions	Quiz 12
	7/20 (Wed)	**6.5 -** Mitochondria and chloroplasts change energy from one form to another **6.6 -** The cytoskeleton is a network of fibers that organizes structures and activities in the cell	Quiz 13
	7/21 (Thu)	No lecture (test only)	Test 2

Week 5	7/25 (Mon)	**6.7 -** Extracellular components and connections between cells help coordinate cellular activities **6.8 -** A cell is greater than the sum of its parts	Quiz 14
	7/26 (Tue)	**7.1** - Cellular membranes are fluid mosaics of lipids and proteins **7.2 -** Membrane structure results in selective permeability	Quiz 15
	7/27 (Wed)	**7.3 -** Passive transport is diffusion of a substance across a membrane with no energy investment **7.4 -** Active transport uses energy to move solutes against their gradients	Quiz 16
	7/28 (Thu)	**7.5** - Bulk transport across the plasma membrane occurs by exocytosis and endocytosis **8.1** - An organism's metabolism transforms matter and energy	Quiz 17
Week 6	8/01 (Mon)	**8.2** - The free-energy change of a reaction tells us whether or not the reaction occurs spontaneously **8.3** - ATP powers cellular work by coupling exergonic reactions to endergonic reactions	Quiz 18
	8/02 (Tue)	**8.4** - Enzymes speed up metabolic reactions by lowering energy barriers **8.5** - Regulation of enzyme activity helps control metabolism	Quiz 19
	8/03 (Wed)	No lecture (test only)	Test 3
	8/04 (Thu)	Check grade / consultation	None

Revised on 01/03/2022