Tsuyama College	Year	2021	Course Title	General Biology

Course Information

Course Code	0023	Course Category	Specialized / Compulsory
Class Format	Lecture	Credits	School Credit: 2
Department	Department of Integrated Science and Technology Advanced Science Program	Student Grade	2nd
Term	Year-round	Classes per Week	2
Textbook and/or Teaching Materials	Textbook: Biology (Tokyo Shoseki) Reference book: Square latest illustration Biology (Daiichi Gakushusha)		
Instructor	MAEZAWA Takanobu		

Course Objectives

1. To understand the evolution of life
2. To understand the function of biological substances in cells
3. To understand ecology and environment

Rubric

	Excellent	Good	Acceptable	Not acceptable
Achievement 1	The student can better explain about the evolution of life and gene mutation	The student can explain about the evolution of life and gene mutation	The student can explain about the evolution of life	The student will not try to explain about the evolution of life
Achievement 2	The student can better explain the function of biomaterials in cells and the role of organelles	The student can explain the function of biomaterials in cells and the role of organelles	The student can explain the function of biomaterials in cells	The student will not try to explain the function of biomaterials in cells
Achievement 3	The student can better explain ecology, environment and diversity	The student can explain ecology, environment and diversity	The student can explain ecology, environment	The student will not try to explain ecology, environment

Assigned Department Objectives

Teaching Method

Outline	General or Specialized : specialized Field of learning : Biology Required, Elective, etc. : Must complete subjects Foundational academic disciplines : Biology / Basic Biology Relationship with Educational Objectives : This subject is the academic objectives of the Department of Comprehensive Science and Engineering "(1) Cultivate human creative talent, rich in practical abilities", "(2) Acquire basic science and technical knowledge" and "(3) Acquire deep foundation knowledge of the major subject area". Relationship with JABEE programs : The main goals of learning / educational goal of this class is "(A) ". Course outline : Advances in molecular biology in the latter half of the 20th century have led to the development of biology to capture life phenomena at the genetic, molecular, and cellular levels. This lecture outlines biology.
Style	Course method : Explain the main points while projecting materials such as figures and tables with a projector or explaining with a board according to the textbook. In a timely manner, issue report assignments that match the content of the lesson, and encourage review and self-study. Grade evaluation method: Equally evaluate the scores of each of the four regular exams (70%), and add the quizzes, reports, and class attitudes up to each regular exam to this (30%), and evaluate each time. As a general rule, the first semester grades are intermediate grades and the grades are a simple average of all results. Textbooks and notebooks cannot be used for exams.
Notice	Precautions on the enrollment : Since this course is a compulsory course, it is necessary to take it (the number of absent hours is less than one-third of the prescribed number of class hours) at the end of the second year. Course advice : Instead of memorizing the knowledge of living things, I want you to understand and acquire the mechanism of life phenomena. Foundational subjects : Biology I (1st year) Related subjects : Chemistry I (2nd years), Chemistry II (3rd), Experiments in Science (2nd), General Biology (2nd), Molecular Biology (3rd), Applied Biology (4th), Developmental Biology (4th), Biology Experiments (4th), Biochemistry (4th), Cell Biology (4th), Bio intermaties (5th) Attendance advice : Adhering to deadlines for report assignments. Late arrivals will be treated as absent after half the class time has passed. If you have any questions about the lecture or anything related to it, please actively ask questions and deepen your understanding.

Characteristics of Class / Division in Learning

☐ Active Learning	☐ Aided by ICT	☐ Applicable to Remote Class	☐ Instructor Professionally Experienced

Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance, origin of life	Explain the origin of life
		2nd	Evolutionary history	Explain the history of evolution
		3rd	Human evolution	Explain human evolution
		4th	Adaptive evolution	Explain adaptive evolution
		5th	Neutral evolution	Explain neutral evolution

		6th	Speciation volume_up content_copy Speciation	Explain speciation
		7th	Review / Summary	
		8th	1st semester mid-term exam	
	2nd Quarter	9th	Return and commentary of exam answers	
		10th	Systematic classification	Explain the difference between prokaryotes and eukaryotes
		11th	Biomaterials and cells	Explain the structure and function of nuclei, mitochondria, chloroplasts, cell membranes, cell walls, and vacuoles. Explain the theory of evolution of chloroplasts and mitochondria. Explain that proteins, nucleic acids, and polysaccharides are each composed of monomers. Explain weak chemical bonds (hydrogen bonds, ion bonds, hydrophobic interactions, etc.) that are important for biological materials. List the amino acids that make up proteins and explain the characteristics of their side chains. The structure of amino acids and the formation of peptide bonds can be explained using structural formulas. Explain the higher-order structure of proteins.
		12th	Proteins that support life phenomena	Explain cell homeostasis by transporting substances through cell membranes. It can raise the function of proteins and explain that proteins are the center of life activities.
		13th	Proteins that support life phenomena	Explain the mechanism of homeostasis in the body by feedback control. Explain the function of signal transmitters and their receptors.
		14th	Review / Summary	
		15th	(1st semester final exam)	
		16th	Return and commentary of exam answers	
2nd Semester	3rd Quarter	1st	Proteins involved in immunity	Explain how the immune system protects the body
		2nd	Metabolism and energy	Understand the terms metabolism, catabolism, and assimilation, and explain the role of ATP as a currency of energy in life activities. Explain what enzymes are and the role of enzymes in metabolism. Explain the structure of enzymes and enzyme-substrate complexes. Explain the properties of the enzyme (substrate specificity, optimum temperature, optimum pH, substrate concentration).
		3rd	Cellular respiration	Explain the general processes of photosynthesis and cellular respiration, and explain the relationship between the two processes. The functions of coenzymes and prosthetic groups can be illustrated. Explain the relationship with water-soluble vitamins. Explain alcoholic fermentation and its use in brewing.
		4th	Photosynthesis	Explain the general processes of photosynthesis and respiration, and explain the relationship between the two processes.
		5th	Nitrogen fixation	Explain nitrogen fixation
		6th	Review / Summary	
		7th	2nd semester mid-term exam	
		8th	Return and commentary of exam answers	
	4th Quarter	9th	Population and environment	Explain the population and environment
		10th	Population and environment	Explain the population and environment
		11th	Interaction between organisms	Explain the interaction between organisms
		12th	Ecosystem energy flow	Explain the flow of energy in the ecosystem
		13th	Biodiversity	Explain biodiversity
		14th	Review / Summary	
		15th	(2nd semester final exam)	
		16th	Return and commentary of exam answers	

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	0	0	0	30	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	70	0	0	0	30	0	100
Cross Area Proficiency	0	0	0	0	0	0	0