



UNITED INTERNATIONAL UNIVERSITY
Department of Computer Science and Engineering (CSE)
Course Syllabus

1	Course Title	Biology for Engineers		
2	Course Code	BIO 3105		
3	Trimester and Year	Summer, 2021		
4	Pre-requisites	Fundamental Biology		
5	Credit Hours	3		
6	Section	C		
7	Class Hours	Saturday: 10:35 AM – 12:05 PM Tuesday: 10:35 AM – 12:05 PM		
8	Class Room	0309		
9	Instructor’s Name	Nipa Roy		
10	Email	nipa@ins.uiu.ac.bd		
11	Office	635 (A)		
12	Counselling Hours	Saturday: 2:00 PM – 5:00 PM Sunday: 9:00 AM — 12:10 PM Monday: 10:35 AM — 1:40 PM; 2:00 PM – 5:00 PM Wednesday: 9:00 AM — 12:10 PM		
13	Text Book	1. Biology for Engineers - Arthur T. Johnson (2 nd Ed.)		
14	Reference	1. Applied Cell and Molecular Biology for Engineers – Editors: Gabi Nindl Waite and Lee R. Waite 2. Biology for Dummies – Rene Fester Kratz and Donna Rae Siegfried (2 nd Ed.) 3. Biology for Engineers – G. K. Suraishkumar 4. A New Biology for the 21st Century – National Research Council of the National Academic, The National Academic Press, Washington D. C.		
15	Course Contents (approved by UGC)			
16	Course Outcomes (COs)	COs	Criteria	
		1	Define/Justify/State/Sketch different biological quantities/systems /entities with examples	
		2	Show/Discuss/Explain/Assess/Design/Draw the various applications/sectors/laws/systems/components of biological entities	
		3	Apply the knowledge of biology in engineering by solving numerical problems, or designing/reproducing biological systems	
17	Teaching Methods	Lecture, Case Studies, Project Developments.		
18	CO with Assessment Methods			
		CO	Assessment Method	(%)
		-	Attendance	5
		3	Assignments	10

		1,2,3	Class Tests	40	
		1,2,3	Midterm exam	20	
		1,2,3	Final exam	25	
19	Mapping of COs and Program outcomes				
	To be included				
20	Course Outline				
	<p>Introduction</p> <p>The Basics of Life: Chemistry</p> <p>Organic Molecules: The Molecules of Life; Cell Structure and Function; Enzymes, Coenzymes, and Energy</p> <p>Biochemical Pathways: Cellular Respiration, Photosynthesis</p> <p>DNA and RNA: The Molecular Basis of Heredity; Cell Division; Patterns of Inheritance; Applications of Biotechnology; Diversity within Species and Population Genetics; Evolution and Natural Selection; The Formation of Species and Evolutionary Change</p> <p>Ecosystem Dynamics: The Flow of Energy and Matter; Community Interactions; Population Ecology; Evolutionary and Ecological Aspects of Behavior; The Origin of Life and Evolution of Cells; The Classification and Evolution of Organisms; The Nature of Microorganisms; The Plant Kingdom; The Animal Kingdom; Materials Exchange in the Body</p> <p>Nutrition: Food and Diet; The Body's Control Mechanisms and Immunity; Human Reproduction, Sex, and Sexuality</p>				
21	Lecture Outline				
	Class/Lecture	Topic	Ref		
	1, 2	Introduction: Why Biology in Engineering; Play with Biology; Scope for Engineers	Text, Ref.3		
	3	The Basics of Life: Chemistry and chemical bonding, H ₂ O and carbon	Ref. 1, 2		
	4	Organic Molecules: Basic organic compounds and their significance in creating life, protein	Text, Ref. 1		
	5, 6	Cell Structure and Function: Plant and animal cells, fluid mosaic model, protein factories of the cell, nucleated and enucleated cells	Text, Ref. 1, 2		
	7	Enzymes, Coenzymes, and Energy	Text, Ref. 1-3		
	8	Biochemical Pathways: Cellular Respiration, Photosynthesis	Text, Ref. 1-3		
	9, 10	DNA and RNA: The Molecular Basis of Heredity; Cell Division; Patterns of Inheritance; The Origin of Life and Evolution of Cells	Text, Ref. 1-3		
	11	Diversity within Species and Population Genetics; Evolution and Natural Selection; The Formation of Species and Evolutionary Change	Text, Ref. 1-3		
	12	Review Class			
		MIDTERM			
	13	Applications of Biotechnology	Text, Ref. 1		
	14	Ecosystem Dynamics: The Flow of Energy and Matter	Text, Ref. 1		
	15, 16	Community Interactions; Population Ecology; Evolutionary and Ecological Aspects of Behavior	Text, Ref. 1, 3		
	17, 18	The Classification and Evolution of Organisms; The Nature of Microorganisms	Text, Ref. 1, 3		
	19	The Plant Kingdom	Text, Ref. 1, 3		
	20	The Animal Kingdom	Text, Ref. 1, 3		
	21	Materials Exchange in the Body	Text, Ref. 1, 2		

22	Nutrition: Food and Diet; The Body's Control Mechanisms and Immunity	Text, Ref. 1, 2, 4
23	Human Reproduction, Sex, and Sexuality	Text, Ref. 1, 3
24	Review Class	
	FINAL	

Appendix 1: Assessment Methods

Assessment Types	Marks
Attendance	5%
Assignments	5%
Class Tests	20%
Mid Term	30%
Final Exam	40%

Appendix 2: Grading Policy

Letter Grade	Marks %	Grade Point	Letter Grade	Marks%	Grade Point
A (Plain)	90-100	4.00	C+ (Plus)	70-73	2.33
A- (Minus)	86-89	3.67	C (Plain)	66-69	2.00
B+ (Plus)	82-85	3.33	C- (Minus)	62-65	1.67
B (Plain)	78-81	3.00	D+ (Plus)	58-61	1.33
B- (Minus)	74-77	2.67	D (Plain)	55-57	1.00
			F (Fail)	<55	0.00

Appendix-3: Program outcomes

POs	Program Outcomes
PO1	An ability to apply knowledge of mathematics, science, and engineering
PO2	An ability to identify, formulate, and solve engineering problems
PO3	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
PO4	An ability to design and conduct experiments, as well as to analyze and interpret data
PO5	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
PO6	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
PO7	A knowledge of contemporary issues
PO8	An understanding of professional and ethical responsibility
PO9	An ability to function on multidisciplinary teams
PO10	An ability to communicate effectively
PO11	Project Management and Finance
PO12	A recognition of the need for, and an ability to engage in life-long learning