Universidad Nacional de Ingeniería (UNI)
Escuela Profesional de
Ciencia de la Computación
Sílabo 2024-II

1. CURSO

BI101FCCS. Biology I (Mandatory)

2. INFORMACIÓN GENERAL

2.1 Curso	:	BI101FCCS. Biology I
2.2 Semestre	:	2^{nd} Semester.
2.3 Créditos	:	3
2.4 horas	:	2 HT; 2 HP;
2.5 Duración del periodo	:	16 semanas
2.6 Condición	:	Mandatory
2.7 Modalidad de aprendizaje	:	Face to face
2.8 Prerrequisitos	:	None

3. PROFESORES

Atención previa coordinación con el profesor

4. INTRODUCCIÓN AL CURSO

Biology is the science of life, and while it may not seem immediately relevant to computer science, it provides a foundation for interdisciplinary fields such as bioinformatics, computational biology, and biologically inspired artificial intelligence. This course introduces the fundamental concepts of biology, from the cell to evolution.

5. OBJETIVOS

- Understand the basic principles of cellular and molecular biology.
- Learn the fundamental processes of life, such as DNA replication, transcription, and translation.
- Appreciate the interrelationship between biology and computing in areas like bioinformatics.

6. RESULTADOS DEL ESTUDIANTE

1) Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions. (Assessment)

6) Apply computer science theory and software development fundamentals to produce computing-based solutions. (Usage)

AG-C01) The Professional and the World: Analyzes and evaluates the impact of solutions to complex computing problems on the sustainable development of society. (Usage)

AG-C07) Computing Knowledge: Applies appropriate knowledge of mathematics, science, and computing. (Assessment)

AG-C12) Applies computer science theory and software development fundamentals to produce computer-based solutions. (Usage)

7. TEMAS

Unidad 1: Introduction to Biology (4 horas)	
Resultados esperados: 1,AG-C07	
Temas	**Objetivos de Aprendizaje (*Learning Outcomes*)**
• Characteristics of living organisms. • Levels of biological organization. • The scientific method in biology.	• Describe the characteristics of living organisms. [Familiarizarse] • Identify the different levels of biological organization. [Usar] • Apply the scientific method in the context of biology. [Evaluar]
Lecturas : [al17], [Rav+17]	

Unidad 2: The Cell (8 horas)	
Resultados esperados: 1,AG-C07	
Temas	**Objetivos de Aprendizaje (*Learning Outcomes*)**
• Cell structure: prokaryotes and eukaryotes. • Cell membranes and transport. • Cell metabolism: respiration and photosynthesis.	• Compare and contrast prokaryotic and eukaryotic cells. [Familiarizarse] • Describe the mechanisms of transport across cell membranes. [Usar] • Explain the processes of respiration and photosynthesis. [Evaluar]
Lecturas : [al17], [Rav+17]	

Unidad 3: Molecular Genetics (12 horas)	
Resultados esperados: 1,AG-C07	
Temas	**Objetivos de Aprendizaje (*Learning Outcomes*)**
• DNA: structure and replication. • RNA: transcription and translation. • Gene regulation.	• Describe the structure and replication of DNA. [Familiarizarse] • Explain the processes of transcription and translation. [Usar] • Understand the mechanisms of gene regulation. [Evaluar]
Lecturas : [al17], [Rav+17]	

Unidad 4: Evolution (8 horas)	
Resultados esperados: 1,AG-C07	
Temas	**Objetivos de Aprendizaje (*Learning Outcomes*)**
• Theory of evolution by natural selection. • Evidence of evolution. • Mechanisms of evolution.	• Explain the theory of evolution by natural selection. [Familiarizarse] • Describe the evidence of evolution. [Usar] • Analyze the different mechanisms of evolution. [Evaluar]
Lecturas : [al17], [Rav+17]	

Unidad 5: Biology and Computing (8 horas)	
Resultados esperados: 1,AG-C07,AG-C12	
Temas	**Objetivos de Aprendizaje (*Learning Outcomes*)**
• Bioinformatics: analysis of biological sequences. • Computational biology: modeling and simulation of biological systems. • Biologically inspired algorithms.	• Describe applications of bioinformatics. [Familiarizarse] • Explain how computation is used in biology. [Usar] • Analyze examples of biologically inspired algorithms. [Evaluar]
Lecturas : [al17]	

Unidad 6: Ecology and Biodiversity (8 horas)	
Resultados esperados: 1,AG-C01,AG-C07	
Temas	**Objetivos de Aprendizaje (*Learning Outcomes*)**
• Ecological interactions. • Biodiversity and conservation.	• Describe the interactions between organisms and their environment. [Familiarizarse] • Explain the importance of biodiversity and conservation. [Usar] • Analyze the impact of human activities on biodiversity. [Evaluar]
Lecturas : [al17], [Rav+17]	

8. PLAN DE TRABAJO

8.1 Metodología

Se fomenta la participación individual y en equipo para exponer sus ideas, motivándolos con puntos adicionales en las diferentes etapas de la evaluación del curso.

8.2 Sesiones Teóricas

Las sesiones de teoría se llevan a cabo en clases magistrales donde se realizarán actividades que propicien un aprendizaje activo, con dinámicas que permitan a los estudiantes interiorizar los conceptos.

8.3 Sesiones Prácticas

Las sesiones prácticas se llevan en clase donde se desarrollan una serie de ejercicios y/o conceptos prácticos mediante planteamiento de problemas, la resolución de problemas, ejercicios puntuales y/o en contextos aplicativos.

9. SISTEMA DE EVALUACIÓN

********* EVALUATION MISSING ********

10. BIBLIOGRAFÍA BÁSICA

[al17] Lisa A. Urry et al. *Campbell Biology*. Pearson, 2017.

[Rav+17] Peter H. Raven et al. *Biology*. McGraw-Hill Education, 2017.