



Universidad Nacional de Ingeniería (UNI)

Escuela Profesional de
Ciencia de la Computación
Sílabo 2024-II

1. CURSO

CS3P2. Cloud Computing (Mandatory)

2. INFORMACIÓN GENERAL

2.1 Curso	: CS3P2. Cloud Computing
2.2 Semestre	: 10 th Semester.
2.3 Créditos	: 3
2.4 horas	: 1 HT; 4 HP;
2.5 Duración del periodo	: 16 semanas
2.6 Condición	: Mandatory
2.7 Modalidad de aprendizaje	: Face to face
2.8 Prerrequisitos	: CS370. Big Data. (9 th Sem)

3. PROFESORES

Atención previa coordinación con el profesor

4. INTRODUCCIÓN AL CURSO

To understand advanced computational techniques, students must have a strong knowledge of various discrete structures, structures that will be implemented and used in the laboratory with the programming language.

5. OBJETIVOS

- Students will be able to model computer science problems using graphs and trees related to data structures.
- Students will efficiently apply traversal strategies to search for data optimally.

6. RESULTADOS DEL ESTUDIANTE

- 1) Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions. (Usage)
- 6) Apply computer science theory and software development fundamentals to produce computing-based solutions. (Usage)

7. TEMAS

Unidad 1: Theoretical Foundations of Cloud Computing (12 horas)	
Resultados esperados: 1,6	
Temas	Objetivos de Aprendizaje (<i>Learning Outcomes</i>)
• Introduction to Cloud Computing • Cloud Computing Service Models • Cloud Computing Deployment Models • Infrastructure and Data Centers • Research Trends in Cloud Computing	• Understand the concepts related to Cloud Computing. • Understand the infrastructure and components of a Data Center. • Understand service models and deployment types in Cloud Computing. • Be familiar with research trends in the area of Cloud Computing.
Lecturas : [aboveTheCloud], [surveySecurity], [mobileCloud]	

Unidad 2: Data Processing (15 horas)	
Resultados esperados: 1,6	
Temas	Objetivos de Aprendizaje (<i>Learning Outcomes</i>)
• Introduction to the Hadoop framework. • Hadoop Distributed File System. • Introduction to the MapReduce programming model. • Introduction to the Spark framework.	• Understand the concepts related to the Hadoop framework. • Understand the concepts related to the Hadoop Distributed File System. • Understand and apply the MapReduce programming model. • Understand the concepts related to the Spark framework.
Lecturas : [mapreduce], [spark], [yarn]	

Unidad 3: Virtualization, Containerization (15 horas)	
Resultados esperados: 1,6	
Temas	Objetivos de Aprendizaje (<i>Learning Outcomes</i>)
• Introduction to Containerization. • Evolution of Containerization. • Differences between Containerization and Virtualization.	• Understand the concept of Containerization. • Create and use containers. • Understand the differences between Containerization and Virtualization.
Lecturas : [CborgOmegaKubernetes], [borg], [ContainerizationPaaSCLoud], [VirtualizationContainerization]	

Unidad 4: Trends in Cloud Computing (12 horas)	
Resultados esperados: 1,6	
Temas	Objetivos de Aprendizaje (<i>Learning Outcomes</i>)
• Autoscaling. • Infrastructure as Code. • Serverless Computing.	• Understand different forms of autoscaling. • Use different tools for Infrastructure as Code in the cloud. • Understand the Serverless Computing paradigm.
Lecturas : [Cormen2009], [Preparata], [Berg]	

Unidad 5: Distributed Systems (15 horas)	
Resultados esperados:	
Temas	Objetivos de Aprendizaje (<i>Learning Outcomes</i>)
• Distributed System Faults • Distributed Algorithms • Distributed System Architectures • Distributed Services • Core Distributed System Concepts	• Distinguish between different types of distributed system faults [Familiarizarse] • Explain the challenges of distributed systems [Familiarizarse] • Write distributed algorithms [Usar] • Measure the performance of distributed systems [Usar] • Explain the rationale behind different distributed system designs [Familiarizarse] • Implement a distributed system [Usar] • Explain the trade-offs in distributed system design [Familiarizarse] • Describe different distributed system architectures [Familiarizarse] • Give examples of distributed systems [Usar]
Lecturas : [Cou+11]	

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

[Cou+11] George Coulouris et al. *Distributed Systems: Concepts and Design*. 5th. USA: Addison-Wesley Publishing Company, 2011.