**Universidad Nacional San Cristobal de Huamanga (UNSCH)**
Programa 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) 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)** | |
|---|---|
| **Resultados esperados: 1,6** | |
| **Temas** | **Objetivos de Aprendizaje (*Learning Outcomes*)** |
| • Introduction to Cloud Computing<br>• Cloud Computing Service Models<br>• Cloud Computing Deployment Models<br>• Infrastructure and Data Centers<br>• Research Trends in Cloud Computing | • Understand the concepts related to Cloud Computing.<br>• Understand the infrastructure and components of a Data Center.<br>• Understand service models and deployment types in Cloud Computing.<br>• Be familiar with research trends in the area of Cloud Computing. |
| **Lecturas :** [**aboveTheCloud**], [**surveySecurity**], [**mobileCloud**] | |

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

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

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

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