



National University of Engineering (UNI)

School of Cybersecurity
Syllabus 2024-II

1. COURSE

CS2B1. Platform Based Development (Mandatory)

2. GENERAL INFORMATION

2.1 Course	:	CS2B1. Platform Based Development
2.2 Semester	:	3 rd Semester.
2.3 Credits	:	3
2.4 Horas	:	1 HT; 4 HP;
2.5 Duration of the period	:	16 weeks
2.6 Type of course	:	Mandatory
2.7 Learning modality	:	Face to face
2.8 Prerequisites	:	CS112. Computer Science I. (2 nd Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

The world has changed due to the use of fabric and related technologies, rapid, timely and personalized access to the information, through web technology, ubiquitous and pervasive; they have changed the way we do things, how do we think? and how does the industry develop? Web technologies, ubiquitous and pervasive are based on the development of web services, web applications and mobile applications, which are necessary to understand the architecture, design, and implementation of web services, web applications and mobile applications.

5. GOALS

- That the student is able to design and implement services, web applications using tools and languages such as HTML, CSS, JavaScript (including AJAX), back-end scripting and a database, at an intermediate level.
- That the student is able to develop mobile applications, administration of web servers in a Unix system and an introduction to web security, at an intermediate level.

6. COMPETENCES

- 2) Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline. (Usage)
- 3) Communicate effectively in a variety of professional contexts.. (Usage)
- 5) Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline. (Usage)
- 6) Apply security principles and practices to maintain operations in the presence of risks and threats. (Usage)
- 7) Develop computational technology for the well-being of all, contributing with human formation, scientific, technological and professional skills to solve social problems of our community. (Usage)

7. TOPICS

Unit 1: Introducción (5 hours)	
Competences Expected:	
Topics	Learning Outcomes
<ul style="list-style-type: none"> • Visión general de plataformas (ejemplo, Web, Mobil, Juegos, Industrial) • Programación a través de APIs específicos. • Visión general de lenguajes de plataforma (ejemplo, Objective C, HTML5) • Programación bajo restricciones de plataforma. 	<ul style="list-style-type: none"> • Describir cómo el desarrollo basado en plataforma difiere de la programación de propósito general [Familiarizarse] • Listar las características de lenguajes de plataforma [Familiarizarse] • Escribir y ejecutar un programa simple basado en plataforma [Familiarizarse] • Listar las ventajas y desventajas de la programación con restricciones de plataforma [Familiarizarse]
Readings : [fielding2000fielding], [grove2009web], [annuzzi2013introduction], [Cornez2015]	

Unit 2: Plataformas web (5 hours)	
Competences Expected:	
Topics	Learning Outcomes
<ul style="list-style-type: none"> • Lenguajes de programación web (e.g., HTML5, Javascript, PHP, CSS) • • Web Platform constraints: Client-Server, Stateless-Stateful, Cache, Uniform Interface, Layered System, Code on Demand, ReST. • Restricción de plataformas web. • Software como servicio. • Estándares web. 	<ul style="list-style-type: none"> • Diseñar e implementar una aplicación web sencilla [Familiarizarse] • Describir las limitaciones que la web pone a los desarrolladores [Familiarizarse] • Comparar y contrastar la programación web con la programación de propósito general [Familiarizarse] • Describir las diferencias entre software como un servicio y productos de software tradicionales [Familiarizarse] • Discutir cómo los estándares de web impactan el desarrollo de software [Familiarizarse] • Revisar una aplicación web existente con un estándar web actual [Familiarizarse]
Readings : [fielding2000fielding]	

Unit 3: Desarrollo de servicios y aplicaciones web (25 hours)	
Competences Expected:	
Topics	Learning Outcomes
<ul style="list-style-type: none"> • Describe, identify and debug issues related to web application development • Design and development of interactive web applications using HTML5 and Python • Use MySQL for data management and manipulate MySQL with Python • Design and development of asynchronous web applications using Ajax techniques • Using dynamic client side Javascript scripting language and server side python scripting language with Ajax • Apply XML / JSON technologies for data management with Ajax • Use framework, services and Ajax web APIs and apply design patterns to web application development 	<ul style="list-style-type: none"> • Server-side python scripting language: variables, data types, operations, strings, functions, control statements, arrays, files and directory access, maintain state. [Usar] • Web programming approach using embedded python. [Usar] • Accessing and Manipulating MySQL. [Usar] • The Ajax web application development approach. [Usar] • DOM and CSS used in JavaScript. [Usar] • Asynchronous Content Update Technologies. [Usar] • XMLHttpRequest objects use to communicate between clients and servers. [Usar] • XML and JSON. [Usar] • XSLT and XPath as mechanisms for transforming XML documents. [Usar] • Web services and APIs (especially Google Maps). [Usar] • Macros Ajax for the development of contemporary web applications. [Usar] • Design patterns used in web applications. [Usar]
Readings : [freeman2011head]	

Unit 4: Plataformas móviles (5 hours)	
Competences Expected:	
Topics	Learning Outcomes
<ul style="list-style-type: none"> • Lenguajes de Programación para Móviles. • Design Principles: Segregation of Interfaces, Single Responsibility, Separation of concerns, Dependency Inversion. • Desafíos con movilidad y comunicación inalámbrica. • Aplicaciones Location-aware. • Rendimiento / Compensación de Potencia. • Restricciones de las Plataformas Móviles. • Tecnologías Emergentes. 	<ul style="list-style-type: none"> • Diseñar e implementar una aplicación móvil para una plataforma móvil dada [Familiarizarse] • Discutir las limitaciones que las plataformas móviles ponen a los desarrolladores [Familiarizarse] • Discutir el rendimiento vs perdida de potencia [Familiarizarse] • Compare y contraste la programación móvil con la programación de proposito general [Familiarizarse]
Readings : [martin2017clean], [annuzzi2013introduction]	

Unit 5: Mobile Applications for Android Handheld Systems (25 hours)	
Competences Expected:	
Topics	Learning Outcomes
<ul style="list-style-type: none"> • The Android Platform • The Android Development Environment • Application Fundamentals • The Activity Class • The Intent Class • Permissions • The Fragment Class • User Interface Classes • User Notifications • The BroadcastReceiver Class • Threads, AsyncTask & Handlers • Alarms • Networking (http class) • Multi-touch & Gestures • Sensors • Location & Maps 	<ul style="list-style-type: none"> • Students identify necessary software and install it on their personal computers. • Students perform various tasks to familiarize themselves with the Android platform and Environment for development. [Usar] • Students build applications that trace the lifecycle callback methods emitted by the Android platform and demonstrate the behavior of Android when device configuration changes (for example, when the device moves from vertical to horizontal and vice versa). [Usar] • Students build applications that require starting multiple activities through both standard and custom methods. [Usar] • Students build applications that require standard and custom permissions. [Usar] • Students build an application that uses a single code base, but creates different user interfaces depending on the screen size of a device. [Usar] • Students construct a to-do list manager using the user interface elements discussed in class. The application allows users to create new items and to display them in a ListView. [Usar] • Students build an application that uses location information to collect latitude, length of places they visit. [Usar]
Readings : [annuzzi2013introduction], [Cornez2015]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

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

10. BASIC BIBLIOGRAPHY