DataBase Foundations

Course Description

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Lecturer
Computer Engineer
School of Engineering
Universidad Distrital Francisco José de Caldas

2024-III

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Outline

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Academic Experience

- **Computer Engineer**, M.Sc. in Computer Engineering, and *researcher* for 15 years.
- 7 years as **full-time associate professor** at colleges, for Computer Engineering programs.
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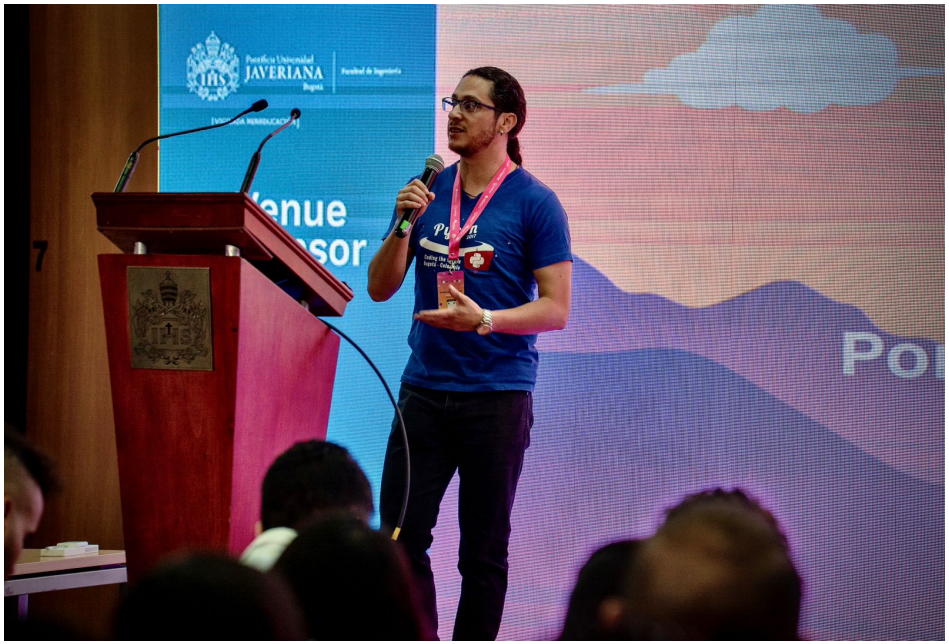

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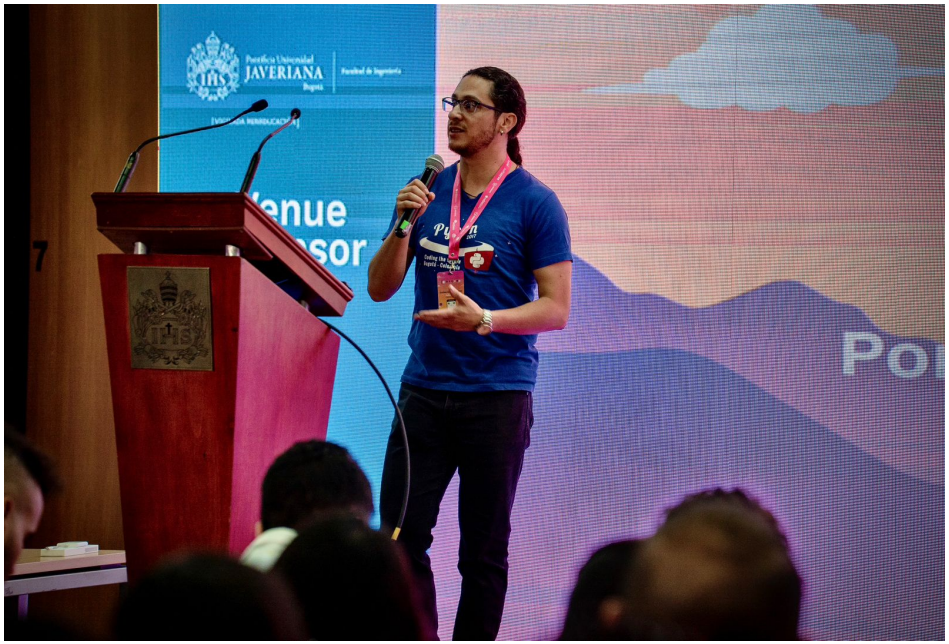

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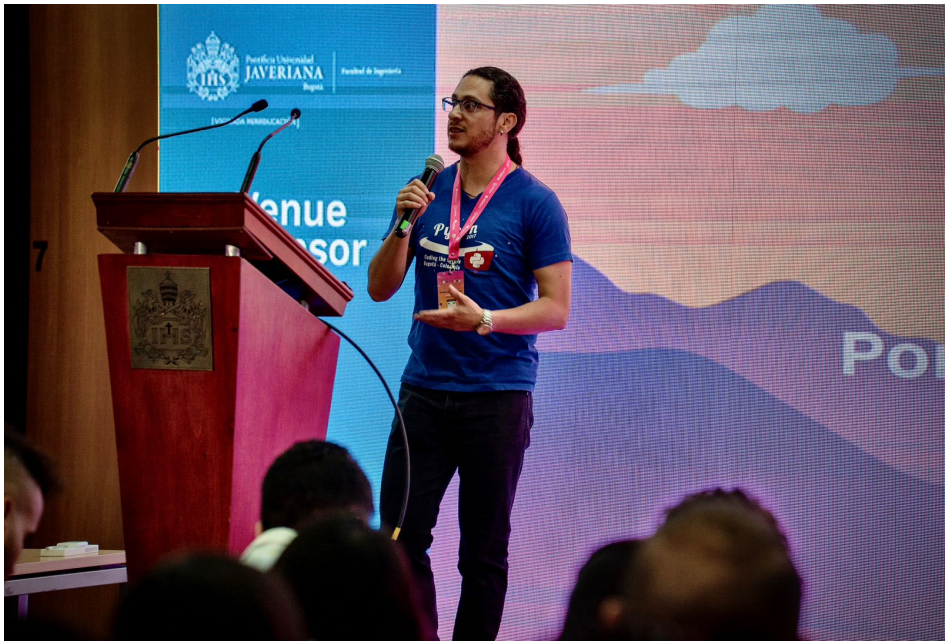

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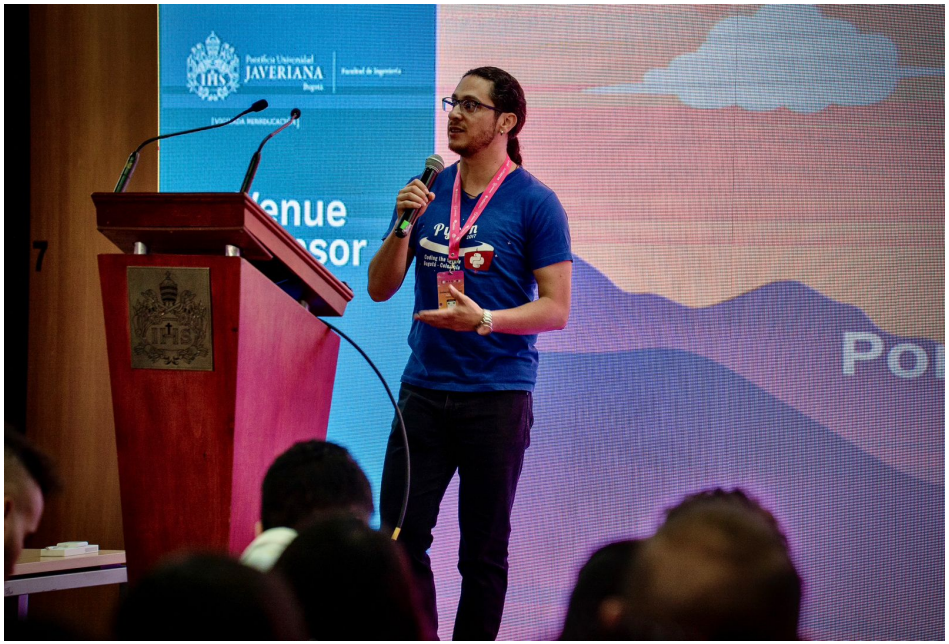

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Overview

This course is designed to introduce undergraduate students to foundations of **database systems** and *good practices* of databases design. This is **not** a course fully focus on **software engineering**, but it is part of main concepts of software systems building.

Classes will consist of lectures, **discussions**, practical examples, and workshops. Also, you must take some readings from *software development*. In addition, there will be a **semester-long project**, as well one **exams**, four **workshops**, and ten additional **assignmens**.

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The main goal of this course is to provide undergraduate students with different **models concepts**, and **tools** for solving the data layer of software problems using **database systems** based on software application project requirements.

At the end of this course you should be able to **create** a full software **database solution** with a good level of **quality**. Also, you should be able to **design** robust database systems in an **agnostic** way.

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Prerequisites

This is a basic course, so you must have some knowledge in:

- **Programming** in Python, Java or C++.
- **Object-Oriented Programming** foundations.
- UML and **Class Diagrams** basic concepts.
- **Git** basic usage, and **GitHub** basic usage.
- Use of **IDEs** like VS Code, Eclipse, or PyCharm.

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Syllabus I

Period	Topic	Time
Period I	Introduction to DataBases	3 sessions
	DataBase Models	3 sessions
	Workshop Introduction to DataBases	1 session
	DataBase Design	4 sessions
	DataBase Tools	2 sessions
	Workshop on DataBase Design	1 session
	Projects Presentation	1 session

Table: Schedule for Period I

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Syllabus II

Period	Topic	Time
Period II	Data Engineering	2 sessions
	SQL Languaje — DDL	3 sessions
	Workshop on DataBase Tools	1 session
	SQL Languaje — DML	2 sessions
	SQL Languaje — DQL	4 sessions
	Workshop on SQL Language	1 session
	Advanced SQL	2 sessions
	Introduction to a Transactional Backend	1 session
	Course Test	1 session
Period III	Projects Dissertation	2 sessions

Table: Schedule for Period II & III

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Grades Percentages

Period	Item	Percentage
Period I	Assignments	5%
	Workshops	20%
	Project	10%
Period II	Assignments	5%
	Workshops	20%
	Course Test	10%
Period III	Paper + Poster	5%
	Project Report	10%
	Project on Production	15%

Table: DataBases Foundations Grades Distribution

Don't hate the player, hate the game

- All asignments must be submitted hand-written on **time** and in **english**. Grammar and spelling will **not** be evaluated.
- Copying and pasting from internet is **forbidden**. Please, **develop** your own solutions.
- Class attendance is **not mandatory**. If you **miss** classes, you must *study by yourself*.
- No cell-phones, no smartwatches, no whatsapp, no tinder, no smartanything. **Just you and your brain**. Pay attention at clase.
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Code of Conduct

- Always be **respectful** to your classmates and to me. You must be **kind** with everyone inside (*and outside*) the classroom.
- There is no a better programming language, tool, or technology. There are only **better** or **worse** solutions.
- You must be **honest** with your work. If you don't know something, just **ask** me. I will be glad to help you.
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Bibliography

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- **Database Systems: The Complete Book**, by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom.
- **Database Management Systems**, by Raghu Ramakrishnan and Johannes Gehrke.
- **Fundamentals of Database Systems**, by Ramez Elmasri and Shamkant B. Navathe.
- **Introducción a los Sistemas de Bases de Datos**, by Date C.J..

Bibliography

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- **Procesamiento de Bases de Datos, Fundamentos, Diseño e Implementación**, by David M. Kroenke.
- **Sistemas de Bases de Datos: Conceptos Fundamentales**, by Elmasri, Navathe.
- **Database System Implementation**, by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom.
- **Fundamentos de Bases de Datos**, by Silberschtz A., Korth H.F, and Sudershan S..

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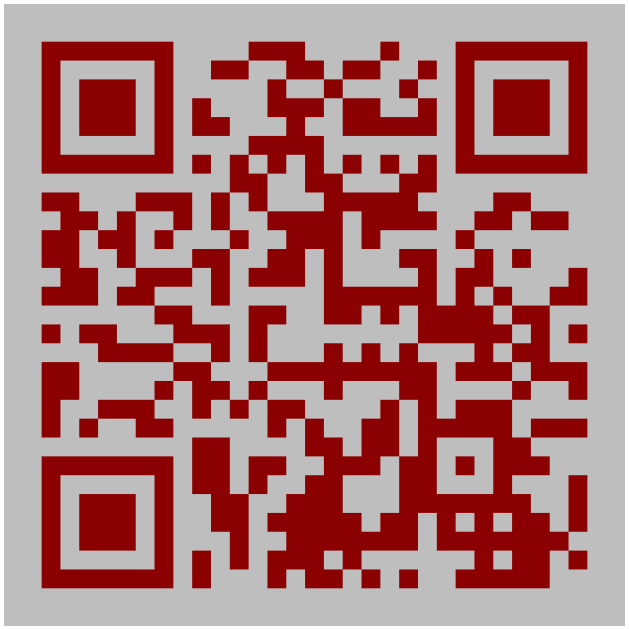

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