Databases II

Course Description

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

2025-I

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Outline

1. You Don't Know Who I Am
2. Course Overview
3. Syllabus
4. Grading & Rules
5. Bibliography

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Academic Experience

- **Computer Engineer**, **MSc.** in Computer Engineering, and *researcher* for the past 15 years.
- 7 years as a **full-time associate professor** at various colleges for Computer Engineering programs.
- 3 years as a **lecturer** at colleges and in government STEM programs.
- **Speaker** in Colombia, Brazil, and Bolivia at IEEE events and colleges.

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Non-academic Experience

- **Co-organizer** of PyCon Colombia and Python Bogotá; collaborated with *ScipyLATAM* and *Jupyter LATAM*.
- +3 years working as a **Software Engineer** for several tech companies in Colombia.
- 3 years working as a **Technical Leader** in Machine Learning and Data Science at a U.S. startup.
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Overview

This course is designed to introduce undergraduate students to advanced topics in **database systems** and *good practices* in both database design and basic implementation.
This is **not** a course fully focused on **software engineering**, but it does cover the main concepts of software systems building.

Classes will consist of lectures, **discussions**, and practical examples. Also, you will be required to complete some readings in *software development*. In addition, there will be a **semester-long project**, as well one **final test**, three **workshops**, and ten additional **assignments**.

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Goals

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

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

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Pre-requisites

This is a basic course, so you should have some knowledge of:

- **Programming** in Python, Java, or C++.
- **Object-Oriented Programming** fundamentals.
- Basic concepts of **Data Structures**.
- Basic concepts of **Relational Databases**.
- Using **IDEs** such as VS Code, Eclipse, or PyCharm.

Additionally, it is desirable to have some knowledge of:

- Basic concepts of **UML** and **Class Diagrams**.
- Basic usage of **Git** and **GitHub**.
- Basic **Linux commands** and basic usage of **Docker**.
- Basic usage of **LaTeX** for technical writing.

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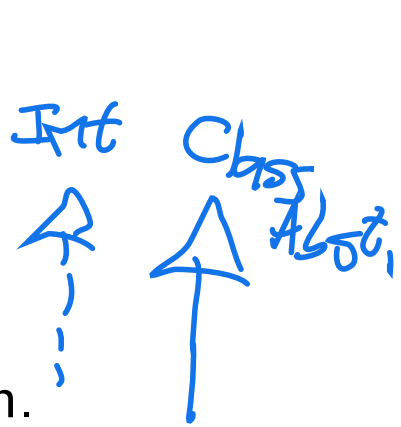

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Syllabus I

Period	Topic	Time
Period I	Introduction to Databases	3 sessions
	Database Systems Architecture	4 sessions
	Database Administration	3 sessions
	Advanced Query Concepts	4 sessions
	Workshop on Queries & Transactions	1 session
	Concurrency Management	3 sessions
	Transaction Management	4 sessions
	Workshop on Concurrency & Transactions	1 session
	Project Catch-Up	1 session

Table: Schedule for Period I

Syllabus II

Period	Topic	Time
Period II	Object-Oriented Databases	3 sessions
	NoSQL Databases	3 sessions
	Parallel Databases	5 sessions
	Workshop on Parallel Databases	1 session
	Distributed Databases	5 sessions
	Multi-dimensional Databases	5 sessions
	Workshop on Data Systems	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 Catch-Up	10%
Period II	Assignments	5%
	Workshops	15%
	Course Test	15%
Period III	Paper + Poster	5%
	Project Report	15%
	Project Implementation	10%

Table: DataBases II 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 both ideas and 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.
- Communications with me must be done by **email** or by **slack**. I will **not** answer any question by *WhatsApp*.

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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.
- You must be **responsible** with your work. If you don't submit **on time**, please don't cry.
- You must **not be annoying**, or affect the **classroom environment**. If you do, I will ask you to **leave** the classroom.

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- **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 C.J. Date.
- **Procesamiento de Bases de Datos, Fundamentos, Diseño e Implementación**, by David M. Kroenke.
- **Sistemas de Bases de Datos: Conceptos Fundamentales**, by Navathe Elmasri.

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- **Fundamentos de Bases de Datos**, by A. Silberschtz, H.F. Korth, and S. Sudershan.
- **Database Systems: Concepts, Design and Applications**, by S.K. Singh.
- **Database Systems: Design, Implementation, and Management**, by Carlos Coronel, Steven Morris, and Peter Rob.

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Thanks!

Questions?

URL: `www.linkedin.com/in/casierrav`

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