DATABASE FOUNDATIONS
Course Description

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

2024-I

Outline

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2. Course Overview

3. Syllabus

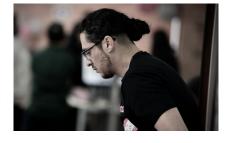4. Grading & Rules

5. Bibliography

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Academic Experience

- **Computer Engineer**, M.Sc. in Computer Engineering, *researcher* for 15 years.

- 7 years as **full-time associate professor** at colleges, for Computer Engineering programs.

- 3 years as **lecturer professor** for both colleges and goverment STEM programs.

- **Speaker** in Colombia, Brasil, Bolivia, at *IEEE* events and colleges.

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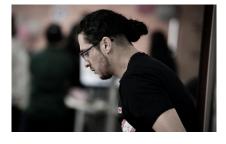
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- PyCon Colombia and Python Bogotá **co-organizer**. Collaborations in ScipyLATAM and Jupyter LATAM.
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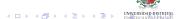- 1 year as **MLOps Engineer** for a Fintech in LATAM.

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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 architecture*. In addition, there will be a **semester-long project**, as well **three** exams, **six** workshops, and **twenty-one** additional assignmens.

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Goals

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** metrics. 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, 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 classes
	DataBase Models	2 classes
	Workshop Introduction to DataBases	1 session
	DataBase Design	3 classes
	Workshop on DataBase Design	1 session
	Test 1	1 session
Period II	DataBase Tools	2 classes
	Data Engineering	2 classes
	Workshop on DataBase Tools	1 session
	SQL Languaje	3 classes
	Workshop on SQL Language	1 session
	Test 2	1 session

Table: Schedule for Period I & II

Syllabus II

Period	Topic	Time
Period III	SQL Language	2 classes
	Workshop on Exploratory Data Analysis	1 session
	NoSQL DataBases	1 classes
	Workshop on NoSQL DataBases	1 session
	Questions and Answers	2 classes
	Final Test	1 session
	Projects Presentation	1 session

Table: Schedule for Period III

Outline

Grades Percentages

Period	Item	Percentage
Period I	Assignments	10%
	Workshops	15%
	Test	10%
Period II	Assignments	10%
	Workshops	15%
	Test	10%
Period III	Workshop + Assigntments	5%
	Final Test	10%
	Course Project	15%

Table: Software Modeling 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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Recommened bibliography:

- **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

Recommened bibliography:

- **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, Sudershan S.

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Thanks!

Questions?

www.linkedin.com/in/casierrav