

SOFTWARE ENGINEERING SEMINAR

Course Description

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

2025-III



UNIVERSIDAD DISTRITAL
FRANCISCO JOSÉ DE CALDAS

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, M.Sc. in Computer Engineering, and researcher for 16 years.**
- 8 years as full-time associate professor at colleges, in Computer Engineering programs.
- 3 years as lecturer professor for both colleges and government STEM programs.
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Non-academic Experience



- **PyCon Colombia** and **Python Bogotá** ~~co-organizer~~.
- 3 years as **software engineer** for several **tech companies** in Colombia.
- 3 years as **Technical Leader** of **Machine Learning and Data Science** at a USA startup.
- 1.5 years as **MLOps Engineer** for a Fintech company in LATAM.
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Overview

This course is designed to **introduce undergraduate students** to the **fundamental concepts** of **software engineering**, including **requirements engineering**, **agile methodologies**, and **collaborative development practices**.

The main focus of the course is on **software testing engineering**. Students will learn about **testing principles**, **test design techniques**, and **automation tools** to ensure software quality. The course covers **unit testing**, **integration testing**, **system testing**, and **test-driven development (TDD)** within **agile frameworks**.

Classes will include **lectures**, **practical exercises**, and **team project**. By the end of the course, students will be able to **define requirements**, apply **agile practices**, and implement effective **testing strategies** in real-world software projects.



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Course Goals

The **main goal** of this course is to provide students with a solid understanding of **software engineering fundamentals**, with a strong emphasis on **software testing**.

By the end of the course, you should be able to:

- Elicit and document requirements for software projects.
- Apply agile methodologies and collaborative practices in development teams.
- Understand and implement testing principles and test design techniques.
- Develop and execute unit, integration, and system tests.
- Use automation tools and apply test-driven development (TDD).
- Evaluate and improve software quality through effective testing strategies.



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Prerequisites

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

- *Programming* in Java, Python, or C++.
- *Foundations* of Object-Oriented Programming.
- Basic concepts of UML and Class Diagrams.
- Basic usage of Git and GitHub. — *pull request*
- Basic concepts of data systems and the relational model.
- Use of *IDEs* such as VS Code, Eclipse, or PyCharm.



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Syllabus I

| Topic | Time |
|-------------------------------------|------------|
| Software Engineering Introduction | 3 sessions |
| Agile Methodologies | 2 sessions |
| Project Management | 2 sessions |
| Requirements Engineering | 3 sessions |
| System Analysis & Design | 2 sessions |
| Software Architectures Fundamentals | 2 sessions |
| Testing Engineering Fundamentals | 2 sessions |
| Catch Up — Course Project | 2 sessions |

Table: Course Schedule — Period I



Syllabus II

| Period | Topic | Time |
|------------|----------------------------|------------|
| Period II | Unit Testing | 4 sessions |
| | Integration Testing | 2 sessions |
| | Acceptance Testing | 3 sessions |
| | System Performance Testing | 2 sessions |
| | Final Test | 1 session |
| Period III | Project Dissertation | 2 sessions |

→ Deploy

Table: Course Schedule — 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 | 20% |
| | Test | 10% |
| Period III | Paper + Poster | 5% |
| | Report + Implementation | 15% |
| | Presentation | 10% |

Table: Software Engineering Seminar — Grades Distribution



Don't hate the player, hate the game

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- Copying and pasting from the internet are **forbidden**. Please **develop** your own ideas and solutions.
- Class attendance is **not mandatory**. If you **miss** classes, you must *study independently*.
- No cell phones, no smartwatches, no WhatsApp, no Tinder, no smart-anything. **Just you and your brain**. Pay attention in class.
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Code of Conduct

- Always be **respectful** to your classmates and to me. You must be **kind** to everyone inside (*and outside*) the classroom.
- There is no best 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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6:00 → 5:59:30



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Bibliography

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- ✓ **Software Engineering**, by [Ian Sommerville](#).
- ✗ **Software Engineering at Google**, by [Titus Winters](#), [Tom Manshreck](#), and [Hyrum Wright](#).
- ✗ **The Pragmatic Programmer**, by [Andrew Hunt](#) and [David Thomas](#).
- ✗ **Clean Code: A Handbook of Agile Software Craftsmanship**, by [Robert C. Martin](#).
- ✗ **Refactoring: Improving the Design of Existing Code**, by [Martin Fowler](#).
- ✓ **Test-Driven Development: By Example**, by [Kent Beck](#).
- ✗ **Agile Estimating and Planning**, by [Mike Cohn](#).
- ✗ **Continuous Delivery: Reliable Software Releases through Build, Test, and Deployment**, by [Jez Humble](#) and [David Farley](#).



Bibliography

Recommended bibliography:

- ✓ **Agile Testing: A Practical Guide for Testers and Agile Teams**, by [Lisa Crispin and Janet Gregory](#).
- ✓ **Specification by Example: How Successful Teams Deliver the Right Software**, by [Gojko Adzic](#).
- ✓ **Domain-Driven Design: Tackling Complexity in the Heart of Software**, by [Eric Evans](#).
- ✓ **Patterns of Enterprise Application Architecture**, by [Martin Fowler](#).
- ✓ **Design Patterns: Elements of Reusable Object-Oriented Software**, by [Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides](#).



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Thanks!

Questions?



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