



National University of Engineering (UNI)
School of Artificial Intelligence
Syllabus 2027-I

1. COURSE

AI266. AI for Software Engineering (Mandatory)

2. GENERAL INFORMATION

- 2.1 Course : AI266. AI for Software Engineering
2.2 Semester : 7th Semester.
2.3 Credits : 4
2.4 Hours : 2 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 :
- AI262. Natural Language Processing. (6th Sem)
 - AI263. Introduction to Machine Learning. (6th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

This course integrates AI techniques into the software development lifecycle, covering practical applications like code generation, automated debugging, and system optimization through machine learning.

5. GOALS

- Implement MLOps pipelines in traditional development environments
- Design systems integrating AI models into software applications
- Evaluate ethical implications in development process automation

6. COMPETENCES

AG-C09) Design and Development of Solutions: Designs, implements, and evaluates solutions for complex computing problems. (Usage)

AG-C12) Uses systemic approaches to select, develop, apply, integrate, and manage secure computing technologies to achieve user objectives. (Usage)

7. TOPICS

Unit 1: AI-SE Fundamentals (12 hours)	
Competences Expected: AG-C09,AG-C12	
Topics	Learning Outcomes
• Design patterns for AI-SE systems • Hybrid system architectures (AI + traditional software) • Quality metrics for intelligent components	• Design software architectures incorporating AI components [Evaluar] • Evaluate trade-offs in hybrid systems [Usar]
Readings : [zhang2022aieng]	

Unit 2: Advanced Applications (24 hours)	
Competences Expected: AG-C09,AG-C12	
Topics	Learning Outcomes
- Automated code generation (Codex, CodeT5) - Intelligent debugging - Automated performance optimization	- Implement AI-assisted code generation tools [Usar] - Integrate recommendation systems into IDEs [Evaluar]
Readings : [allamanis2018survey], [chen2021codet5]	

Unit 3: Automation Ethics (8 hours)	
Competences Expected: AG-C09,AG-C12	
Topics	Learning Outcomes
- Risks of automated code generation - Biases in developer recommendation systems - Legal liability in autonomous systems	- Identify ethical critical points in AI-SE [Familiarizarse] - Propose mitigation protocols [Usar]
Readings : [zhang2022aieng]	

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