



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

1. COURSE

AI400. Research Methodology (Mandatory)

2. GENERAL INFORMATION

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|-----------------------------------|---|---|
| 2.1 Course | : | AI400. Research Methodology |
| 2.2 Semester | : | 7 th Semester. |
| 2.3 Credits | : | 2 |
| 2.4 Hours | : | 1 HT; 2 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 | : | <ul style="list-style-type: none">• CS212. Analysis and Design of Algorithms. (5th Sem)• BEI201. Technical and professional English III. (3rd Sem) |

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

This course provides methodological tools to design, execute, and communicate computing research projects, integrating ethical aspects, academic communication techniques, and collaborative work.

5. GOALS

- Formulate computing research problems with methodological rigor.
- Apply scientific literature search and analysis techniques.
- Communicate research results effectively and ethically.

6. COMPETENCES

- AG-C02) Ethics:** Applies ethical principles and commits to professional ethics and the standards of professional computing practice. (Assessment)
- AG-C04) Communication:** Communicates effectively in complex computing activities. (Assessment)
- AG-C05) Project Management:** Applies management principles in computing to manage projects. (Assessment)
- AG-C08) Problem Analysis:** Identifies, formulates, and analyzes complex computing problems. (Assessment)
- AG-C09) Design and Development of Solutions:** Designs, implements, and evaluates solutions for complex computing problems. (Assessment)

7. TOPICS

Unit 1: Research Fundamentals (12 hours)	
Competences Expected: AG-C02,AG-C04,AG-C05,AG-C08,AG-C09	
Topics	Learning Outcomes
• Scientific method in computing • Types of research studies • Research question formulation	• Analyze complex research problems [Usar] • Differentiate quantitative/qualitative methodologies [Familiarizarse]
Readings : [Booth2016], [Creswell2014]	

Unit 2: Research Ethics (12 hours)	
Competences Expected: AG-C02,AG-C04,AG-C05,AG-C08,AG-C09	
Topics	Learning Outcomes
• Professional research responsibilities • Plagiarism and intellectual property • Research ethics committees	• Evaluate ethical dilemmas in research projects [Evaluar] • Apply citation and copyright norms [Usar]
Readings : [Resnik2015], [IEEEethics]	

Unit 3: Scientific Communication (24 hours)	
Competences Expected: AG-C02,AG-C04,AG-C05,AG-C08,AG-C09	
Topics	Learning Outcomes
• Writing scientific papers • Effective academic presentations • Peer review process	• Produce technical documents following standards [Usar] • Defend research results orally [Evaluar]
Readings : [Sword2012], [Zobel2014]	

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