1. COURSE
CS401. Methodology of Computation Research (Mandatory)

2. GENERAL INFORMATION
2.1 Credits	:	3
2.2 Theory Hours	:	2 (Weekly)
2.3 Practice Hours	:	-
2.4 Duration of the period	:	16 weeks
2.5 Type of course	:	Mandatory
2.6 Modality	:	Face to face
2.7 Prerrequisites	:	CS212. Analysis and Design of Algorithms. (5th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE
The objective of this course is for the student to learn how to carry out scientific research in the area of computers. The teachers of the course will determine an area of study for each student, and the student will be given a bibliography to analyze. From this bibliography, and from additional bibliographic sources (researched by the student), the student should be able to construct a survey type article on the assigned topic.

5. GOALS

- That the student learns how to start a scientific investigation in the area of computing.

- That the student knows the main sources to obtain relevant bibliography for research works in the area of computing: Researchindex, IEEE-CS[1], ACM[2].

- That the student is able to analyze the existing proposals on a certain topic and relate them in a coherent way in a bibliographic review.

- That the student can write technical documents in computing using LaTeX.

- The student will be able to reproduce the existing results on a given topic through experimentation.

- The deliverables of this course are:

    Parcial advance: Mastery of the subject of the article and preliminary bibliography in article format LaTeX.

    Final: Understanding of the survey type article, concluded document containing, optionally, the experimental results of the studied technique(s).

6. COMPETENCES

a) An ability to apply knowledge of mathematics, science. (**Usage**)

b) An ability to design and conduct experiments, as well as to analyze and interpret data. (**Usage**)

c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. (**Usage**)

d) An ability to function on multidisciplinary teams. (**Usage**)

e) Understand correctly the professional, ethical, legal, security and social implications of the profession. (**Usage**)

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[1] http://www.computer.org
[2] http://www.acm.org

f) An ability to communicate effectively. (**Usage**)

h) A recognition of the need for, and an ability to engage in life-long learning. (**Usage**)

i) An ability to use the techniques, skills, and modern computing tools necessary for computing practice. (**Usage**)

k) Apply the principles of development and design in the construction of software systems of variable complexity. (**Usage**)

l) Develop principles research in the area of computing with levels of international competitiveness. (**Usage**)

p) Improve the conditions of society by putting technology at the service of the human being. (**Assessment**)

7. SPECIFIC COMPETENCES

a29) Demonstrate math and computer skills in an integrated final project

b18) Define requirements in an integrated fine project.

c11) Design and implement integrated software.

d1) Collaborative software development using code repositories and version management (e.g., Git, Bitbucket, SVN)

d5) Develop software that is ready to be integrated with other components or pieces of software

e1) Demonstrate a proper understanding of the ethical implications of the software you build.

e2) Demonstrate a proper understanding of the safety implications of the software you build.

e9) Promote an ethic that founds the professional skills that are formed during the career.

f1) Clearly transmit technical proposals to audiences in other areas.

f2) Transmit technical proposals in the area of computing in English.

f3) Transmit technical proposals in English to audiences in other areas.

g1) Develop solutions that solve an existing problem in our society.

g2) Design efficient software solutions based on a correct understanding of the architecture of a computer or a group of them.

h1) Develop research projects with levels of complexity appropriate for undergraduate study.

h2) Demonstrate the ability to learn to learn autonomously.

i2) Use programming languages and environments that allow the implementation and debugging of solutions.

k10) Demonstrate mastery of the principles of quality software development in an integrated project

l1) Demonstrate that you have developed research according to an undergraduate level.

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8. TOPICS

Unit 1: (60)	
Competences Expected: a,b,c,i,h	
Topics	**Learning Outcomes**
• Bibliographic search in computers. • Writing technical articles on computers.	• Learn to do correct research in the area of computing. [Usage] • Knowing the sources of adequate literature for this area. [Usage] • Knowing how to write a document in accordance with the characteristics that the conferences in this area require. [Usage]
Readings : [IEE08], [Ass08], [Cit08]	

9. WORKPLAN

9.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

9.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

9.3 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.

10. EVALUATION SYSTEM

********* EVALUATION MISSING ********

11. BASIC BIBLIOGRAPHY

[Ass08]   Association for Computing Machinery. *Digital Libray.* http://portal.acm.org/dl.cfm. Association for Computing Machinery, 2008.

[Cit08]   CiteSeer.IST. *Scientific Literature Digital Libray.* http://citeseer.ist.psu.edu. College of Information Sciences and Technology, Penn State University, 2008.

[IEE08]   IEEE-Computer Society. *Digital Libray.* http://www.computer.org/publications/dlib. IEEE-Computer Society, 2008.