

University of Puerto Rico  
Mayagüez Campus  
College of Engineering  
Department of Electrical and Computer Engineering

**Course Syllabus**

<b>1. General Information:</b> Alpha-numeric codification: ICOM5047 Course Title: Design Project in Computer Engineering Number of credits: 3 Contact Period: 1 hour lecture and 4 hours laboratory per week
<b>2. Course Description:</b> English: Capstone course in which student teams design a project to solve a complete Computer Engineering Problem considering engineering standards and realistic constraints. The project should integrate both hardware and software.  Spanish: Curso integrador en el cual equipos de estudiantes diseñan un proyecto para resolver un problema completo de Ingeniería de Computadoras, tomando en consideración estándares de ingeniería y restricciones realistas. El proyecto debe integrar conceptos de “hardware” y “software.”
<b>3. Pre/Co-requisites and other requirements:</b> (ICOM4009 or ICOM5016) and (ICOM4217 or INEL5206 or INEL5265) and (INEL 4207, INEL 4301, ICOM4215, ICOM 5007) or consent of the director of the department
<b>4. Course Objectives:</b> After completing the course, students should understand and manage all aspects related to the solution of a problem in Computer Engineering, thus demonstrating the knowledge acquired in previous courses. The student should demonstrate his/her capability to solve a real engineering problem.
<b>5. Instructional Strategies:</b> <input type="checkbox"/> conference <input type="checkbox"/> discussion <input checked="" type="checkbox"/> computation <input checked="" type="checkbox"/> laboratory <input checked="" type="checkbox"/> seminar with formal presentation <input type="checkbox"/> seminar without formal presentation <input checked="" type="checkbox"/> workshop <input type="checkbox"/> art workshop <input type="checkbox"/> practice <input type="checkbox"/> trip <input type="checkbox"/> thesis <input type="checkbox"/> special problems <input type="checkbox"/> tutoring <input type="checkbox"/> research <input type="checkbox"/> other, please specify:
<b>6. Minimum or Required Resources Available:</b> The course includes 5 hours of laboratory work per week for the development, modeling and implementation of the project, depending on its scope and nature.

## 7. Course time frame and thematic outline<sup>1</sup>

<b>Outline</b>	<b>Contact Hours</b>
Project Management and use of PM tools (MS project, etc.)	5
Proposal writing	2
Teamwork skills	2
Document and Information Management	2
Report writing	2
Environmental Impact	2
Creativity, Innovation, System Design	4
Ethics	3
Demonstrations	3
Oral presentations	6
Laboratory project work	44
<b>Total hours: (equivalent to contact period)</b>	<b>75</b>

## 8. Grading System

Quantifiable (letters)  Not Quantifiable

## 9. Evaluation Strategies

	<b>Quantity</b>	<b>Percent</b>
<b>Proposal</b>	<b>1</b>	<b>10%</b>
<b>Proposal Presentation</b>	<b>1</b>	<b>5%</b>
<b>Progress Report</b>	<b>1</b>	<b>10%</b>
<b>Progress Presentation</b>	<b>1</b>	<b>5%</b>
<b>Demonstration 1 (Detailed Design)</b>	<b>1</b>	<b>10%</b>
<b>Demonstration 2 (Separate modules functional and tested)</b>	<b>1</b>	<b>10%</b>
<b>Demonstration 3 (System fully integrated, functional and tested)</b>	<b>1</b>	<b>20%</b>
<b>Final Report</b>	<b>1</b>	<b>15%</b>
<b>Final Presentation</b>	<b>1</b>	<b>5%</b>
<b>Attendance and Punctuality<sup>2</sup></b>		<b>5%</b>
<b>Homework assignments, open capstone, and quizzes</b>	<b>Several</b>	<b>5%</b>
<b>TOTAL:</b>		<b>100%</b>

<sup>1</sup> Refer to <http://ece.uprm.edu/~icom5047/calendar.html>, ICOM5047 – Schedule for details and updates.

<sup>2</sup> Refer to Policies and Norms of ICOM5047

### Grading Scale

Letter	Score
<b>A</b>	<b>90-100</b>
<b>B</b>	<b>80-89</b>
<b>C</b>	<b>70-79</b>
<b>D</b>	<b>50-69</b>
<b>F</b>	<b>0-49</b>

#### 10. Bibliography:

- Smith, Karl A. Teamwork and Project Management. McGraw-Hill. Boston 2000. 2nd Edition.
- Meredith, Jack R. and Mantel, Samuel J. Project Management: a Managerial Approach. John Wiley and Sons. 2003.
- IEEE Standards.
- ISO Standards.
- Selected publications depending on project topic.

#### According to Law 51

The Comprehensive Educational Services Act for People with disabilities states that after identifying with the instructor and the institution, the student with disabilities will receive reasonable accommodation in their courses and evaluations. For more information contact the Department of Counseling and Psychological services at the Office of the Dean of Students (Office DE 21) or call 787-265-3864 or 787-832-4040 x 3772, 2040 and 3864.

#### Sexual Harassment: Certification 130-2014-2015 states:

Sexual harassment in the workplace and in the study environment is an illegal and discriminatory act and is against the best interests of the University of Puerto Rico. All persons who understand they have been subject to acts of sexual harassment at the University of Puerto Rico may file a complaint and request that the institution investigate, where necessary, and assume the corresponding action by the university authorities. If the complainant is a student, he or she must refer his or her complaint to the Office of the Student Ombudsperson or that of the Dean of Students.

According to **certification 16-43 of the Academic Senate**, a course may include up to 25% of its total contact hours via the Internet.

12. Course Outcomes	Map to Program Outcomes
1. Identify a problem or opportunity for a computer engineering solution or innovation and define the technical specifications with the user/client.	(e) (1)
2. Analyze and discuss the problem as well as previous or related work	(a) (1)

3. Write a project proposal to solve a computer engineering problem specifying the solution, the work breakdown structure, budget and realistic constraints.	(e) (1)
4. Organize the teamwork and define individual tasks and responsibilities	(d) (5)
5. Design, implement, and test a system to solve the desired needs; identify and design the components within realistic constraints and using engineering standards	(c) (2)
6. Design a test plan for the system	(b) (6)
7. Evaluate the ethical, legal, environmental, social, health and safety, and other impacts of the system and propose the mitigation, or compensation measures when necessary	(f) (4)
8. Write effective documentation using engineering standards, present the results, and make demonstrations of system functionality	(g) (3)
9. Use modern computer engineering tools for analysis of the problem, computer aided design, debugging, implementation, and testing of the system.	(k) (1, 2)
10. Assess the final economic, environmental, legal, and other aspects of the project in a post-mortem review	(h) (4)
11. Make project decisions based on current literature and state-of-the-art tools available on campus, or provided by client/user when applicable	(i) (7)
12. Assess Intellectual Property potential of the project and its implications in such issues as licensing, and marketing; among others	(j) (4)
13. Incorporate engineering standards and multiple realistic constraints	(c) (2)