



University of Puerto Rico
Mayagüez Campus
College of Engineering
Department of Mechanical Engineering
Bachelor of Science in Mechanical Engineering



Course Syllabus

1. General Information:
Alpha-numeric codification: INME 4057 Course Title: Engineering Design Number of credits: 4 Contact Period: Two hours of lecture and three-hours periods of computation per week.
2. Course Description:
English: Formulation, design and analysis of engineering projects; creative aspects of design; design methodology, safety, liability and patents. Technical presentation, both oral and written.
Spanish: Formulación, diseño y análisis de proyectos de ingeniería, aspectos creativos de diseño, seguridad, responsabilidad y patentes. Presentaciones técnicas, tanto orales como escritas.
3. Pre/Co-requisites and other requirements:
Prerequisites: INME 4002 and (INME 4107 or INME 4007) and INME 4012 and INME 4015.
4. Course Objectives:
Upon successful completion of this course, students will be able to: <ul style="list-style-type: none">• Identify, formulate a problem statement with clear objectives, and solve the problem by applying principles from the various basic courses of engineering, science, and mathematics (1);• Find, evaluate and use resources to learn independently in the area of expertise needed to understand the problem (7);• Use engineering knowledge to generate design solutions to assist individuals or corporations that meet specified needs (2);• Make clear and effective technical presentations, both in terms of form as well as content, of his/her work and write clear technical reports describing his/her work (3);• Use of proper engineering judgment in the area of systems design guided by ethical, environmental, and professional considerations (4);• Use project management tools such as Gantt charts, Pareto charts, critical path analysis, and action items for planning, prioritizing, and scheduling tasks in a design project work effectively. Work on project teams in both member and leader roles, with team members who may have different backgrounds and technical skill levels (5);• Develop and conduct appropriate prototype and interpret the results, and use engineering judgment to draw conclusions (6).
5. Instructional Strategies:
<input type="checkbox"/> conference <input type="checkbox"/> discussion <input type="checkbox"/> computation <input type="checkbox"/> laboratory
<input checked="" type="checkbox"/> seminar with formal presentation <input type="checkbox"/> seminar without formal presentation <input type="checkbox"/> workshop
<input type="checkbox"/> art workshop <input checked="" type="checkbox"/> practice <input type="checkbox"/> trip <input type="checkbox"/> thesis <input type="checkbox"/> special problems <input type="checkbox"/> tutoring

research other, please specify: Final Design Project

6. Minimum or Required Resources Available:

Transportation to external facilities.

7. Course time frame and thematic outline

General Topics	Contact Hours
Problem Statement and Project Specification	1-2
Alternative Solutions	1-2
Project Management	1-2
Engineering Standards	1-2
Material and Component Selection	1-2
Manufacturing Considerations	1-2
Preliminary Design Report	1-2
Engineering Analysis	1-2
Engineering Experiment	1-2
Safety Through Design	1-2
Liability and Ethics	1-2
Environmental and Sustainability Considerations	1-2
Maintenance and Operating Manual	1-2
Proof-of-concept Methods	1-2
Executive Summary	1-2
Practice	90
Total hours: (equivalent to contact period)	15-120

8. Grading System

Quantifiable (letters) Not Quantifiable

9. Evaluation Strategies

	Quantity	Percent
<input type="checkbox"/> Exams		
<input type="checkbox"/> Final Exam		
<input type="checkbox"/> Short Quizzes		
<input checked="" type="checkbox"/> Oral Reports	1-4	25
<input type="checkbox"/> Monographies		
<input type="checkbox"/> Portfolio		
<input checked="" type="checkbox"/> Projects	1-4	75
<input type="checkbox"/> Journals		
<input type="checkbox"/> Other, specify:		
TOTAL:		100%

10. Bibliography:

Textbook:

Worek, W. and Sadeh A.M. (2017) Mark's Standard Handbook for Mechanical Engineers: NY, McGraw-Hill.

11. 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.

12. Academic Integrity

The University of Puerto Rico promotes the highest standards of academic and scientific integrity. Article 6.2 of the UPR Students General Bylaws (Board of Trustees Certification 13, 2009-2010) states that academic dishonesty includes, but is not limited to: fraudulent actions; obtaining grades or academic degrees by false or fraudulent simulations; copying the whole or part of the academic work of another person; plagiarizing totally or partially the work of another person; copying all or part of another person answers to the questions of an oral or written exam by taking or getting someone else to take the exam on his/her behalf; as well as enabling and facilitating another person to perform the aforementioned behavior. Any of these behaviors will be subject to disciplinary action in accordance with the disciplinary procedure laid down in the UPR Students General Bylaws.—

13. Certification 06-43 of the Academic Senate

"The academic guidelines for offering online courses," defines: Traditional face-to-face courses are those that have less than 25% of the course's regular contact hours via the Internet. Therefore, a three-credit course will be considered "face to face" if, of the 45 hours of regular contact, 11 or less are taught via the Internet. According to certification 06-43 of the Academic Senate, a course may include up to 25% of its total contact hours via the Internet. The objective of this is so that all professors have this alternative in the case of any unscheduled eventuality.

14. 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.

Revised: February, 2019