

MEGR 3156 - Design Projects Lab II

Catalog Data	Study of the process of design and reduction to practice of engineering concepts in a team environment. Requirements definition, concept synthesis, concept evaluation, project planning and execution.
References	Reference Texts: <ol style="list-style-type: none">1. Machinery's Handbook, 29th Edition, Industrial Press.2. Gere and Goodno, Mechanics of Materials, Cengage Learning, 2009.3. Philpot, Mechanics of Materials, Wiley Publishing, 2010
Goals	This course is designed to develop skills in mechanical system design, written and oral communication, and group decision-making and task management.
Prerequisite	Prerequisites: MEGR 2144, MEGR 2156, MEGR 2180, ECGR 2161 with grades of C or better.
Class Topics	Team Design <ul style="list-style-type: none">• Design partitioning• Decision-making techniques• Assignments/action item methods• Documenting designs• Presenting designs• Project management• Team management System Design and Integration <ul style="list-style-type: none">• Interface definition• Requirements definition• Power transmission• Electrical subsystems<ul style="list-style-type: none">□ motors□ controls• Performance modeling• Strength/weight considerations Prototype Development <ul style="list-style-type: none">• Standard design practices• Design for Manufacture• Time and cost estimating

- Outcomes** At the end of this course, the student will be able to:
1. Design a mechanical system based on user requirements such as strength and weight considerations.
 2. Design and implement basic electrical circuits for actuating components as part of a mechanical system.
 3. Working in an engineering group, develop a design package that includes design requirements, design description, and analyses demonstrating that design requirements are met.
 4. Working in an engineering group, deliver an oral presentation of the design package.
 5. Outline and explain a procedure for mechanical design that begins with user requirements, develops functional specifications, analyzes a variety of alternatives, and chooses a final design to best meet user requirements.
 6. Demonstrate proficient use of modern computer tools for writing, presentation, project management, and group communications.
 7. Design something that works.

Computer Usage

- CAD software (e.g., ProEngineer or SolidWorks)
- MS Project
- Mathcad
- Word processing software (e.g., MS Word)
- Graphics software (e.g., Visio, CorelDraw, etc.)
- Presentation software (e.g., MS Powerpoint)

Laboratory The student machine shop is used as required to build prototypes.

Design Content Each group of students formulates a functional specification, completes a design, documents the design and design decisions, details the design with a design package, fabricates a prototype to use for further design evaluation, and tests the prototype via a performance competition.

Grading * Project 70%, Final Exam 25%, Quizzes 5%

Follow-on Courses MEGR3255, MEGR 3355, MEGR 3455 – Senior Design I/Motorsports Clinic II/Energy Clinic II

Academic Integrity Students have the responsibility to know and observe the requirements of the UNCC Code of Student Academic Integrity, policy 407, <http://legal.uncc.edu/policies/up-407>. This code forbids cheating, fabrication or falsification of information, multiple submission of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty.

Program Outcomes This course contributes to the fulfillment of program outcomes ME3, ME4, and ME 12 (ABET criteria c and d). Student attainment of outcomes ME3 and ME12 is assessed in this course.

Coordinator Kevin Lawton

Prepared by Kevin Lawton

* The grading policy may be modified by the instructor for each section of the course.