ME 4041 Interactive Computer Graphics and Computer-Aided Design (Elective)

**Catalog Description:** ME 4041 Interactive Computer Graphics and Computer-Aided Design (3-0-3)
Prerequisites: ME 3180 Machine Design and ME 3345 Heat Transfer
Principles of geometric modeling, finite-element method, and interactive computer graphics hardware and software. CAD and CAE applications in thermal and mechanical design problems. Design projects.


**References:** Web-based notes; on-line user manual.

**Topics Covered:**

1. Introduction.
2. Features of CAD/CAE/CAM systems.
5. Finite-element theory.
7. Computer graphics.

**Course Outcomes:**

Outcome 1: To explain the basics of geometric modeling and computer graphics.

Outcome 2: To explain the theory behind the finite-element method (FEM) and to provide insight into the practical aspects of FEM.

Outcome 3: To develop skills in the design and analysis of practical engineering problems through the integration of geometric modeling, FEM, and computer graphics.

Outcome 4: To gain hands-on experience with commercial CAD/CAE packages.

Outcome 5: To underscore the importance of validating the results obtained from numerical models.
Correlation between Course Outcomes and Student Outcomes:

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GWW School of Mechanical Engineering Student Outcomes:

(a) an ability to apply knowledge of mathematics, science and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(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
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Prepared by: Raghu Pucha, Dave Rosen, Suresh Sitaraman, and Yan Wang