Fall 2025: ME403 - 103
MECHANICAL SYSTEMS DESIGN I

Instructor: Dr. Yufeng Song
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Class: Days/Times –Thursday (6:00 PM – 8:50 PM);
KUPF 211 , Credits – 3.00

TA: Mohammadal Rashidioun
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Office Hours: There are no specific office hours. Please email me to schedule an appointment. We can meet on any day at our mutually convenient time.

Textbook:
Atila Ertas, Jesse Jones, The Engineering Design Process, John Wiley & Sons, 1996, 2nd edition.
Engineering Design with SolidWorks, Planchard and Planchard, SDC, Publications, 2024

Course Description:
Lectures and projects covering problem solving methodology in the design, analysis, and synthesis of mechanical and thermal systems. The student's academic background combines with engineering principles and topics to serve as a foundation for broad engineering projects. Emphasis on creative thinking and the engineering design process in projects involving optimal conversion of resources

EVALUATION SCHEME:
Your course grade will be determined as follows:

• Homework	10 %
• Projects (5 reports) *[one report per team]*	40 %
• Exam 1	15 %
• Exam 2	15 %
• Final Exam	20 %
Total	100%

Course Syllabus

Classes	Topic	Project Assignments
1	Introduction/Engineering Design Search on Process/CAE/CAD/CAM Library Awareness User Skills	**Project #1: MCAE Software Literature Search**
2	Structured and Unstructured Problems	
3	Design Methods	
4	Creative Design/Ideation	**Project #2: Solid Model Design**
5	Innovations in Engineering Design	
	Exam 1	
6	Design Synthesis/Mathematical Models	
7	Decision Processes/Material Selection	**Project #3: FEA Simulation in Mechanical Systems**
8	Decision Support: Selection Problem	
9	Finite Element Analysis/Modeling and Simulation in Mechanical and Thermal/Fluid Systems	**Project #4: FEA Simulation in Thermal Systems**
	Exam 2	
10	Decision Support: Compromise Problem	
11	Optimization Methods in Design: Overview	
12	Optimization/Mathematical Methods	**Project #5: Design Proposal for ME 408**
13	Leadership and Professionalism in Engineering/Engineering Law/Engineering Ethics	
14	**FINAL EXAM**	

TENTATIVE GRADING SCHEME:

Letter Grade	Total Weighted Mark
A	> 90
B+	85-89.9
B	80-84.9
C+	75-79.9
C	70-74.9
D	60-69.9
F	< 60