ME555    Thermal Systems Design
Spring 2016

Schedule #:    21966
Instructor:    Richard Ayala
               E425
               rayala@mail.sdsu.edu
Office Hours:    MW 19:00-20:00 and by appointment
Class Time:    F, 17:30-20:10 (5:30-8:10) (SSW-1500)
Text:     This course will use material from various sources and the recommended text does not
          cover all material discussed.
Recommended but not required:
Additional Reference text but not required:

Objective:
This course will present the design of thermal systems to meet a customer requirement. A design
concept will be developed and component selection and analysis and overall system design and
analysis performed. A group project is required.

Grading:
In-Class Design Projects........................................... 20%
Group Project.......................................................... 65%
   Interim Report   (25%)
   Final Report    (40%)
Homework.............................................................. 15%
Total.................................................................100%
(Homework solutions will be posted on Blackboard)
Grade Scale:
A    87-100
B    75-86
C    65-74
D    55-64
F    0-54

Course Description:
Analysis, design, and optimization of thermal systems using microcomputers. Modeling of
thermal systems and components. Thermal system component characteristics and their effect on
overall system performance. Relationship among thermal sciences in design process.
Introduction to thermoeconomic optimization.
Prerequisites:
Mechanical Engineering 351 and Mechanical Engineering 452.

Final Exam: TBD (Final Report Submission)

ME555 Topics
I Introductory Concepts
   Design Requirements
   Thermal Systems
II Combustion
III Thermal System Components
   Heat Exchangers
      Basic Principles
      Design Configurations
      Boiling/Condensation
   Piping Systems
      Series & Parallel Systems
      Losses
   Prime Movers
      Pumps/Fans/Compressors
      Turbines
IV Thermal System Design & Optimization
   Thermal System Design
      Component Sizing
      System Analysis
   Economic Analysis