MEC 422 Thermal System Design

Instructor: Dr. Hui Zhang, 165 Light Engineering Building, 2-8492. Hui.Zhang@stonybrook.edu
Lab: Dr. Lin-shu Wang, 250(214D) Heavy Engineering Building, 2-8342
(Blackboard available)

Course Description

Thermal System Design. Credit 3. Device design and system design. Quantitative data for system design including operating characteristics of compressors, turbines, heat exchangers, piping systems, internal combustion engines, and other component equipment. Component matching and system simulation. Optimization including thermo-economic evaluation and energy analysis. Case studies: refrigeration and air conditioning systems; combined cycles; steam-injected gas turbines.

Course prerequisites

MEC 305.

Textbook


References


Meeting Times

Lectures: MWF 10:40 - 11:35 am; 079 Earth and Space
Lab: M (3:50-6:50pm) WF (2:20-3:15pm). There will be one lab in the semester. It will be arranged during the recitation time
Recitation: M 3:50-5:00pm; Melville LBR E 4315 (TA: Chen, Yu)
Instructor's office hours: Tuesday 9-11am; Tuesday 2-4pm, 165 Light Engineering Building
TA's office hours: Tuesday 1-3pm; Thursday 10am-noon, 234 Light Engineering Building

Course Objective and Topics

Operating characteristics of common devices are reviewed. This course introduces the essential requirement of component matching in a system. Optimization of thermal system performance is also introduced and the students apply their knowledge to design projects.

1. Design process
2. Fluid mechanics review and piping systems
3. Pumps and turbines
4. Heat transfer review and heat exchangers
5. Industrial projects
Labs (Taught by Professor Linshu Wang; TA: Lu, Xionghui):

Heat Pump Experiment

Grading and Class Policies

Final grade is determined based on your performance on the following five items
- Attendance, 10%
- Homework, 15%
- Projects, 10%+15%
- Lab, 10%
- Final, 40%

Class Policies:

No late homework is accepted. Homework must be turned in during the class on the specified due date.

ACADEMIC INTEGRITY SYLLABUS STATEMENT
Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/