

San José State University
Mechanical Engineering
ME115, Thermal Engineering Lab, Spring 2016

Class: Sect.: Code: Day: Time Instructor:
 S01 21596 Mon 1430 - 1715 Andrew Werdowatz
 S02 22116 Tues 1430 - 1715 Andrew Werdowatz
 S03 22430 Thurs 1430 - 1715 R. Vargas-Gonzalez
 S05 26487 Wed 1330 - 1615 J. Mokri
 S06 30022 Thurs 1800 - 2045 R. Vargas-Gonzalez

Instructors: Instructor: Email:
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 Andrew Werdowatz andrew.werdowatz@yahoo.com

Instructor's Office: Office hours and location to be arranged on an as-needed basis between instructor and student.

Classroom: Engineering Building, Room E113

Prerequisites: ME 114 Heat Transfer (may be taken concurrently)

Class Website: http://engr.sjsu.edu/ndejong/me_115.htm

Course Schedule

Mtg.	Date (Week of):	Topic:	Location:
1	1/25	Introduction / Design of Experiments	ENG 113
2	2/1	Air Conditioning Experiment	ENG 113
3	2/8	Air Conditioning Experiment Report	ENG 113
4	2/15	Spark Ignition Experiment	ENG 113
5	2/22	Spark Ignition Experiment Report	ENG 113
6	2/29	Finite Difference Experiment	Computer Lab (option)
7	3/7	Steam Turbine Experiment	ENG 113
8	3/14	Steam Turbine Experiment Report	ENG 113
9	3/21	Hot Dog Anemometer Experiment	ENG 113
10	4/4	Hot Dog Anemometer Experiment Report	ENG 114a
11	4/11	DOE/Heat Exchanger Experiment	ENG 114a
12	4/18	Heat Exchanger Experiment Report	ENG 113

13	4/25	Piping Network Experiment	ENG 113
14	5/2	Piping Network Experiment Report	ENG 113
15	5/9	Central Plant Tour or Makeup	ENG 113

Copies of the course materials such as the syllabus, major assignment handouts, etc. may be found on the class website. You are responsible for regularly checking email for messages.

Course Goals and Student Learning Objectives

By the end of this course, students should be able to:

- Explain how thermocouples, manometers, orifice plates, rotameters, wind tunnels and other basic laboratory equipment work and use them correctly
- Write professional laboratory reports
- Design and conduct a simple lab experiment
- Describe the operation and performance of a spark-ignition engine using correct terminology
- Describe how and why engine performance changes with RPM
- Calculate important engine parameters such as specific fuel consumption, brake power, and torque using experimental data
- Describe the operation and performance of a steam turbine using correct terminology
- Analyze a steam turbine and condenser using the first law of thermodynamics and appropriate properties
- Describe the operation of an air conditioner
- Analyze an air conditioner using the first law and appropriate properties for air/water mixtures
- Derive finite difference equations
- Use the finite difference method to analyze steady-state two-dimensional heat transfer
- Properly use one-dimensional transient conduction and convection equations to calculate experimental heat transfer parameters.
- Perform energy balance calculations on a water to air heat exchanger
- Describe how heat exchangers are characterized
- Calculate important heat exchanger characterization parameters

Reports

Summary Reports are required for each of the lab experiments. The report requirements for the finite difference project will be discussed during that lab session and typically include Excel sheet result printouts, hand derivation of one cell equation, and a brief paragraph of what you did and your results. For all labs, representative calculations must be included in an appendix in a clear, organized, manner. All equations must be shown. If you use a program such as Excel for your calculations, also include sample calculations showing the equations used and how the calculations were performed. Professional reports are required.

The summary report guidelines and a list of common errors are attached. The report guidelines can also be found at class website.

Lab reports are due by 5:00 pm in the instructor's mailbox two school days after your last lab for a given topic, unless otherwise instructed during class. Bring your textbook and calculator to class. You are welcome to use either your own laptop or one of the lab computers. You will work in groups during each lab except for the finite difference lab. Each group should have three or four students. No teams of more than 5 students are permitted.

Classroom Protocol / Attendance

If you know that you must miss a lab, you may be able to attend a different lab session if space permits and you make advance arrangements with the instructor. You must spend both weeks for the given lab in that section. If you miss a lab unexpectedly due illness (with a note from the medical center or a hospital) or other emergency, please contact your instructor as soon as possible to discuss your options.

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of forty-five hours over the length of the course (normally 3 hours per unit per week). The lab itself can count for 1.5 hours per unit per week with the additional 1.5 hours for analysis and report preparation.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the [current academic calendar](http://www.sjsu.edu/academic_programs/calendars/academic_calendar/) web page located at http://www.sjsu.edu/academic_programs/calendars/academic_calendar/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

Grading Policy

Grading sheets for the Summary Reports are posted on the course website. Course grade breakdown is as follows: six (6) Team Summary Reports, 15% each, one (1) Individual Finite Difference summary, 10%.

A confidential peer evaluation form may be completed for each lab. You will not get credit for a lab if you do not participate in both the experiment and calculations or have made arrangements with your instructor to make up your work due to emergency. Poor participation can lower your grade up to an entire letter grade.

University Policies

Academic integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The [University's Academic Integrity policy](http://www.sjsu.edu/senate/S07-2.htm), located at <http://www.sjsu.edu/senate/S07-2.htm>, requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sa.sjsu.edu/judicial_affairs/index.html) is available at http://www.sa.sjsu.edu/judicial_affairs/index.html.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the [Disability Resource Center](http://www.drc.sjsu.edu/) (DRC) at <http://www.drc.sjsu.edu/> to establish a record of their disability.