

**San José State University**  
**Engineering / Mechanical and Aerospace**  
**ME 183 - Section 1 (Code 22923)**  
**HVAC Systems Design - Spring 2016**

<b>Instructor:</b>	Sargon Ishaya
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<b>Office Hours:</b>	By appointment or after class
<b>Class Days/Time:</b>	Tuesday/Thursday: 1800-1915 (6:00PM – 7:15PM)
<b>Classroom:</b>	ENG 341
<b>Prerequisites:</b>	ME 111 Fluid Dynamics, ME 114 Heat Transfer or equivalent

### **Faculty Web Page**

Copies of the course materials such as the syllabus, major assignment handouts, etc. may be found on CANVAS. You are responsible for checking this web site to download the course materials and handouts as well as for checking the progress of the grade that you are earning in the course.

### **Course Description**

This course will prepare students to work as an entry-level HVAC engineer in a mechanical consulting firm or at a design-build contractor's office.

### **Course Goals and Student Learning Objectives**

At the end of this course the student will be able to do the following tasks:

- 1) Perform load calculations
- 2) Write a Basis of Design for an HVAC system.
- 3) Design an air-conditioning system to serve an office building.
- 4) Specify and select HVAC equipment.
- 5) Draw up the design documents for the HVAC system of an office building.

## Required Texts / Readings

### Textbook

All Trane clinic books (Order Number: 1-43.165, Price: \$215) available at the following URL: <http://www.trane.com/COMMERCIAL/DNA/View.aspx?i=463>

The cost for the books on the website is over \$215.00 when considering shipping. You may purchase the books from the website or from the instructor. The instructor offers the entire package for \$150.00.

### Other Readings

Class handouts that will be posted on the class website.

## Classroom Protocol

Please interrupt the teacher during lectures if there is anything that you do not understand and ask questions. Studies show that when one student has a question, there are many others who have the same question and are not asking. **The exams, quizzes, and homework will largely depend on the lecture material instead of the textbook. Please take copious notes during lectures and make sure that everything said by the lecturer is understood by you. Ask questions!**

## 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 section at <http://info.sjsu.edu/web-dbgen/narr/static/catalog/policies.html>. Add/drop deadlines can be found on the web page located at <http://www.sjsu.edu/academics>. The late drop 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/>.

Instructors are no longer able to add students freely; rather, a petition must be submitted in the MAE Department office.

## Assignments and Grading Policy

There is no way that any student will be given any breaks or favors regarding their grades no matter what the situation is. Even foreign students who claimed that they will lose their visa if they go on academic probation have not been accommodated in the past. There is no extra credit available. Grades are calculated by entering the scores into a spreadsheet and cell formulae calculate the grades. Those grades are FINAL.

Grading:	Projects (2 @ 20% each)	40%
	Homework	20%
	Mid-term Exam	20%
	Final Exam	20%

Grade Distribution:

Letter Grade	Lower Range of Combined Grade (%)	Upper Range of Combined Grade (%)
A+	100	97
A	93	96.9
A-	90	92.9
B+	89.9	87
B	83	86.9
B-	80	82.9
C+	77	79.9
C	73	76.9
C-	70	72.9
D+	67	69.9
D	63	66.9
D-	60	62.9
F	0	59.9

Exams: One mid-term and one final exam will be given. Exams are open-book and open-note. You may **NOT** use a phone, calculator, computer, laptop, or anything with an on/off switch on exams. You may not communicate with anyone in any way during exams. Exams must be taken on the scheduled dates unless:

- a) You show a note from the medical center or a hospital documenting illness or emergency
- b) You make other arrangements with the instructor before the exam date.

Homework: Homework format should be neat, and every step in the solution process should be shown. Assumptions, knowns, and unknowns should be included. **Summarize the problem statement at the beginning.** Feel free to work the problems using any computer program you wish, but I recommend you use a spreadsheet like Microsoft Excel. You are encouraged to **discuss** homework problems with your classmates. All homework should be submitted to the instructor in PDF format through CANVAS before the deadline so there is no excuse if you miss class. Late homework will not be graded. Homework assignments will be graded at random, but all will be collected.

## **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](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.

### **Student Technology Resources (Optional)**

Computer labs for student use are available in the Academic Success Center located on the 1<sup>st</sup> floor of Clark Hall and on the 2<sup>nd</sup> floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library.

A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include digital and VHS camcorders, VHS and Beta video players, 16 mm, slide, overhead, DVD, CD, and audiotape players, sound systems, wireless microphones, projection screens and monitors.

### **Learning Assistance Resource Center (Optional)**

The Learning Assistance Resource Center (LARC) is located in Room 600 in the Student Services Center. It is designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. The center provides support services, such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. The [LARC website](http://www.sjsu.edu/larc/) is located at <http://www.sjsu.edu/larc/>.

### **SJSU Writing Center (Optional)**

The SJSU Writing Center is located in Room 126 in Clark Hall. It is staffed by professional instructors and upper-division or graduate-level writing specialists from each of the seven SJSU colleges. Our writing specialists have met a rigorous GPA requirement, and they are well trained to assist all students at all levels within all disciplines to become better writers. The [Writing Center website](http://www.sjsu.edu/writingcenter/about/staff/) is located at <http://www.sjsu.edu/writingcenter/about/staff/>.

### **Peer Mentor Center (Optional)**

The Peer Mentor Center is located on the 1<sup>st</sup> floor of Clark Hall in the Academic Success Center. The Peer Mentor Center is staffed with Peer Mentors who excel in helping students manage university life, tackling problems that range from academic challenges to interpersonal struggles. On the road to graduation, Peer Mentors are navigators, offering “roadside assistance” to peers who feel a bit lost or simply need help mapping out the locations of campus resources. Peer Mentor services are free and available on a drop –in basis, no reservation required. The [Peer Mentor Center website](http://www.sjsu.edu/muse/peermentor/) is located at <http://www.sjsu.edu/muse/peermentor/>

## ME 183 / HVAC Design, Spring 2016 Course Schedule

*The schedule is subject to change and will be posted to CANVAS when there is an update.*

Week	Date	Task
Week 1	28-Jan	Introduction, Protocol of HVAC Design Process Load Calculations – Unit Loads, Space Loads, Envelope Loads
Week 2	2-Feb	Project Assignments Load Calculations – Internal Loads, Units, Zones, Spaces Load Calculations – Computer program, Spreadsheet integration and review
Week 3	9-Feb	CAD drawings and symbols, Writing a Basis of Design
Week 4	16-Feb	Psychrometrics – The Lines of a Psychrometric Chart, Latent, Sensible, Heating, Adiabatic Cooling, Steam Humidification, Desiccant Dehumidifying
Week 5	23-Feb	Psychrometrics – Air Mixing, Ventilation, Loads, System Plots
Week 6	1-Mar	Distribution – Duct System Design
Week 7	8-Mar	Distribution – Duct System Integration with other trades, Airside Devices
Week 8	15-Mar	Office System Design - VAV Reheat and Double Duct, Sample Midterm Handout
Week 9	22-Mar	Mid Term on Tuesday, Midterm Solution Review on Thursday
<b>Spring Break</b>	<b>29-Mar</b>	<b>Spring Break</b>
Week 10	5-Apr	Equipment – DX Package Units and Heat Pumps
Week 11	12-Apr	Equipment - Duct Furnaces and Boilers
Week 12	19-Apr	Equipment - Fans and fan selection, Economizers, Fan/Duct Interaction
Week 13	26-Apr	Equipment - Rotary/Centrifugal Chillers, Cooling Towers, Absorption Chillers
Week 14	3-May	Equipment - Solar Cooling, Thermal Storage Systems, Green Engineering
Week 15	10-May	Hourly load calculations, Sample Final Exam Handout
Week 16	17-May	Lecture Makeup or Topic TBA
Final	19-May	Final Exam (5:15PM TO 7:30PM)

All homework assignments are due at 6:00PM on the following Tuesday of the week in which they appear unless they are project assignments. Project assignments are due by midnight of the Friday of the week in which they appear.