1. **Department, number and title of course:**
   **Mechanical and Aerospace Engineering, EML 4601, Section 3E03**
   **Heating and Air Conditioning System Design**

   Instructor: Kurt Schulze, Ph.D., P.E., Room NEB 231
   Email address: schulzek@ufl.edu
   Cell phone: 407 375-8684
   Office hours: TBD
   Meets in room FLG 230, 5th period 11:45-12:35 PM
   TA: Utkarsh Ahuja. Time and location will be posted on Canvas.

2. Course(catalog)Description: Credits 3, EML 4601, Prereq: EML 3100.
   Heating and air conditioning systems: equipment selection, system arrangement, load calculations, advanced psychrometrics, duct and piping system design, air distribution system design, indoor air quality.

3. Textbooks(s) and /or other required material:
   a. Title: *None required*
   Suggested Reading: ASHRAE Fundamentals Handbook, Join ASHRAE as a student member at the Student Zone, ASHRAE.org for a great deal!

4. Course Objectives: The course provides a broad coverage of refrigeration and air conditioning theory and practice in order to prepare students for a career in industry, consulting engineering practice or for further graduate studies with a specialization in refrigeration and/or air conditioning, with emphasis on system design and specification. The project design method, delivery system and constructability are emphasized in this course. Project management associated with design and construction administration is also discussed.

5. **Course Topics**

| **Week of** | **Topic** | **Suggested Reading Assign.** | **Comments** |
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| **Jan 6** | **HVAC design delivery methods**<br>**Basic HVAC Systems**<br>**Pipe sizing, duct sizing and psyc calculations** | **powerpoint** | **Download Carrier HAP this week** |
| **Jan 13** | **Codes, Regulations and Standards, continue HVAC system discussion** | **Chapters 8,9 and 40 Fundamentals Handbook** | **Join ASHRAE!!** |
| **Jan 20**<br>**Jan 20- holiday** | **Review of Heating and Cooling Load Calculations** | **Chapters 29.30 and 31** | **Carrier HAP assignment** |

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| **Jan 27** | **Energy Conservation/Cost Estimating/Life Cycle Costing** | **Chapter 32** | **Design assignment** |
| **Feb 3** | **System Selection Strategies/Specifications**<br>**Exam #1** | | |
| **Feb 10** | **Generation Equipment/heating-cooling** | **Chapters 1, 18** | |
| **Feb 17** | **Generating Equipment Assemblies, CHP, Solar and absorption chillers** | | **Applicable codes, standards, schematics and specifications are presented** |
| **Feb 24** | **Driving Systems (pumps and fans)**<br>**Selection and Sizing** | **Chapters 35,36** | |
| **Mar 9**<br>**Week of Mar 2 Spring Break** | **Heat Exchangers and Accessories (shell and tube, fin and tube, steam traps, etc.)**<br>**Workshop on project** | **Chapters 2,3,4,5** | **Applicable codes, standards, schematics and specifications are presented** |
| **Mar 16** | **Secondary and Tertiary Distribution Systems (Steam, water and air distribution)**<br>**Exam #2** | **Chapter 21,33,34,35,36** | **Applicable codes, standards, schematics and specifications are presented** |
| **Mar 23** | **Terminal Units (steam, water, air and electric)** | **Chapter 33** | **Applicable codes, standards, schematics and specifications** |
| **Mar 30** | **Controls** | **Chapter 15** | **Applicable codes, standards, schematics and specifications are presented** |
| **Apr 6** | **Accessories** | | |
| **Apr 13** | **Final Design Help, review** | | |
| **April 20** | **Final Design Due 20 , exam review** | **Exam 3 this week** | |

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| | **Classes end 22 Apr** | | |

6. There will be three exams and homework for grade. Included in homework grade is a Final Design Project. All exams are cumulative but will emphasize the most recent material. The exams will be scheduled during class hours but is subject to change. **PLEASE NOTE:** The test dates may change depending on the pace of covering the material. Students are responsible to be available to take tests during the announced day and time. No exceptions but for sickness or emergency.

7. Grading Policy (exam is open books, notes and computers)

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| Homework (includes project work) | 55% Homework important! |
| Exam 1, 2 and 3 | 15% each |

Grading Scale: 95-100 A, 90-94 A-,85-89 B+, 80-84 B, 75-79 B-,70-74 C+, 65-69 C, 60-64 C-,55-69 D+,50-55 D, 46-49 D-

**Make-up Policy:** No late assignments will be accepted. Makeup exams are not normally allowed. If you cannot attend an exam or cannot meet a due date, you must contact the instructor prior to the exam or due date. Arrangements will be made for students on a case by case basis. (Failure to contact the instructor prior to the exam or assignment prior to the due date will result in a zero on that exam/assignment.)

8. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.
9. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.
10. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
    - University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
    - SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
    - Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
    - Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.
11. Class Demeanor—Class is started on time. On many occasions, notes have already been placed on the board to expedite starting time. Students are expected to be on time or early. Engineers are expected to be on time for meetings and this

is an excellent habit to cultivate! Turn off cell phones, etc, before coming into class.

12. Course Evaluation**:** Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu/evals. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/