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 MAE-A 328
   Email address: schulzek@ufl.edu
   Cell phone: 407 375-8684
   Office hours: Monday 4th period 10:40-11:30, Wednesday 3th period 9:35-10:25 or by appointment.
   Meets in room FLG 270, 5th period 11:45-12:35 PM
   TA: TBD. 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), software and /or other required material:**
   a. Title: *None required. Notes provided by instructor*
   Suggested Reading: ASHRAE Fundamentals Handbook, Join ASHRAE as a student member at the Student Zone, ASHRAE.org for a great deal!
   b. Carrier HAP and other HVAC software will be provided to students at no cost.

4. **Required Computer*:***
   This is discussed on both the department and college websites:
   - https://www.eng.ufl.edu/students/resources/computer-requirements/
   - https://mae.ufl.edu/academics/prospective/undergraduate/computer-requirements/
   Bottomline: if you don't have a laptop, you need one that can run Windows based software.

5. **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. By the end of the course, the student will have completed a preliminary schematic design of a building's HVAC system.

6. **Course Topics**

Week of	Topic	Suggested Reading Assign.	Comments
Jan 9	**HVAC design delivery methods**	**powerpoint**	**Download**

	Basic HVAC Systems Pipe sizing, and psyc calculations		Carrier HAP this week 1st day of class is 9Jan
Jan 16	**HVAC system discussion**	**Chapters 8,9 and 40 Fundamentals Handbook**	**Jan 16 is a holiday.** **Join ASHRAE!!**
Jan 23	**Review of Heating and Cooling Load Calculations** **HAP intro part 1**	**Chapters 29.30 and 31**	**Carrier HAP assignment**
Jan 30	**Energy Conservation/Cost** **Duct sizing** **Air Balance, HAP part 2**	**Chapter 32**	**Design assignment**
Feb 6	**System Selection Strategies/Specifications** *Exam #1 this week!*		
Feb 13	**Generation Equipment/heating-cooling/Blr Chiller selection**	**Chapters 1, 18**	**HHW piping type**
Feb 20	**Generating Equipment Assemblies, CHP, Solar and absorption chillers.** **AHU selection/mech rm**		**Applicable codes, standards, schematics and specifications are presented**
Feb 27	**Driving Systems (pumps and fans)** **Selection and Sizing**	**Chapters 35,36**	
Mar 6 **Week of Mar 13** **Spring Break**	**Heat Exchangers and Accessories.** **Estimating/Life Cycle Costing ((LCC)** **Workshop on project**	**Chapters 2,3,4,5**	**Applicable codes, standards, schematics and specifications are presented**
Mar 20	**Secondary and Tertiary Distribution Systems (Steam, water and air distribution)** *Exam #2 this week!*	**Chapter 21,33,34,35,36**	**Applicable codes, standards, schematics and specifications are presented**

Mar 27	Terminal Units (steam, water, air and electric)	Chapter 33	Applicable codes, standards, schematics and specifications
Apr 3	Controls	Chapter 15	Applicable codes, standards, schematics and specifications are presented
Apr 10	Accessories Mech Drawings LEED, Abs Chillers		
Apr 17	Final Design Help, review		
April 24	Final Design Due 24, exam review Classes end 26 Apr	*Exam 3 this week!*	

7. **There will be three exams and homework for grade**. Exams will be during normal class period. 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 course topics and 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.

8. **Attendance Policy, Class Expectations, and Make-Up Policy**
   Class attendance is expected but will not be monitored. *Lectures are not recorded.* Since there is no text, your best resource are the notes you take in class. You are responsible for participating, staying up to date on all announcements, in-class lectures, posted class material, and homework. Excused absences for homework submission and quizzes must be consistent with university policies in the undergraduate catalog and requires appropriate documentation. Homework extensions and make-up quizzes will be provided for excused absences in which notification is provided before the assignment due date. Note: club sport activities are not excused absences, personal vacations are not excused absences.
   https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

9. **Grading Policy (exam is open books, notes and computers)**
   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-

Collaboration during homework is allowed but individual assignments will need to be completed individually. However, some assignments will allow students to work in teams of two to replicate the work environment in industry. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies:
https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

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.)

10. *Students Requiring Accommodations*
    Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.
    Course Evaluation
    Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

11. *In-Class Recording*
    Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

    A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student

presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

12. **University Honesty Policy**
    UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Conduct Code (https://sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. If you have any questions or concerns, please consult with the instructor or TAs in this class.

13. **Commitment to a Safe and Inclusive Learning Environment**
    The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

    If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
    • Your academic advisor or Graduate Program Coordinator
    • Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@ufl.edu
    • Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
    • Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: https://counseling.ufl.edu, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

COVID-19
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus.

- If you are withheld from campus by the Department of Health through Screen, Test & Protect, you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the UF Health Screen, Test & Protect website for more information.
- Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling; https://career.ufl.edu.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/;https://care.dso.ufl.edu.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.