Course Change Request

New Course Proposal

Date Submitted: 10/03/17 2:17 pm

Viewing: AREN 440: Architectural Engineering Heating, Ventilating and Air Conditioning Design

Last edit: 01/23/18 9:10 am
Changes proposed by: s.shields

Programs referencing this course

Faculty Senate Number

Contact(s)
<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morad Atif</td>
<td><a href="mailto:matf@tamu.edu">matf@tamu.edu</a></td>
<td>979-862-9137</td>
</tr>
</tbody>
</table>

Course prefix: AREN  Course number: 440

Department: College of Engineering
College/School: College of Engineering
Academic Level: Undergraduate
Undergraduate course level justification (Select One)
Prerequisites: 
All prerequisites will be enforced through COMPASS.

Academic Level: Graduate (alternate)
Effective term: 2018-2019

Complete Course Title:
Architectural Engineering Heating, Ventilating and Air Conditioning Design

Abbreviated Course Title: AREN HVAC DESIGN

Catalog course description:
Project-based design course; select and develop the mechanical system for a building, from the programming phase to the design development and working documents; emphasis on the application HVAC principles in the design and analysis of a mechanical system in a real building, including review of building thermal load calculations & energy analysis, HVAC design goals and schematic design, system selection and system design, HVAC design development, HVAC design documents, and energy, environmental, and human comfort considerations in HVAC design.

Prerequisites and Restrictions:
Grade of C or better in AREN 300 and AREN 330.

Concurrent Enrollment: No

https://nextcatalog.tamu.edu/courseleaf/approve/
Enforced Prerequisites / Concurrent Enrollment

<table>
<thead>
<tr>
<th>And/Or</th>
<th>Course Prefix/Number</th>
<th>Min Grade/Score</th>
<th>Academic Level</th>
<th>Concurrency?</th>
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<tbody>
<tr>
<td>And</td>
<td>AREN 300</td>
<td>C</td>
<td>UG</td>
<td></td>
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<tr>
<td></td>
<td>AREN 330</td>
<td>C</td>
<td>UG</td>
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Crosslistings: No, Crosslisted With
Stacked: No, Stacked with

Semester: 3
Credit Hour(s): Contact Hour(s)
(per week):
Lecture: 3
Lab: 0
Other: 0
Total: 3

Repeatable for credit? No
Three-peat? No
CIP/Fund Code: 1404010006
Default Grade Mode: Letter Grade(G)
Alternate Grade Modes: Satisfactory/Unsatisfactory
Method of instruction: Lecture
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) No

Will this course be taught as a distance education course? No
Is 100% of this course going to be taught in Texas? Yes
Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

<table>
<thead>
<tr>
<th>Program(s)</th>
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<tbody>
<tr>
<td>(BS-AREN) Architectural Engineering</td>
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</tbody>
</table>

Required (select program)

Elective (select program)

Has/will this course be(een) submitted for core curriculum consideration? No
Has/will this course be(een) submitted for Writing or
### Course Syllabus

<table>
<thead>
<tr>
<th>Syllabus:</th>
<th>Upload syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letters of support or other documentation</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Additional information**

**Reviewer Comments**

`s.shields (09/22/17 2:38 pm): The Prereq for this course should be AREN 300, not 320. **Sandra Williams (sandra-williams) (09/25/17 4:20 pm): Rollback: Syllabus has wrong Aggie Honor Code website link. Form: please update catalog course description to comply with the catalog style guide for course descriptions http://registrar.tamu.edu/Our-Services/Curricular-Services/Catalog/Style-Guide-for-Catalog-Course Descriptions.**

**Tim Jacobs (tijacobs) (09/26/17 8:37 pm): Rollback: MEEN 436 is only offered once / year; suggest making it a co-requisite to avoid any delays in the student taking the course. Remove "or approval of department head"; we will handle overrides on a consistent policy basis.**

`s.shields (09/27/17 12:13 pm): Dr. Jacobs - Thank you for the pre/co-requisite suggestion for MEEN 436. The new AREN 440 AREN HVAC course is an advanced HVAC lecture/project base course that will require students to already have a working knowledge of HVAC. For this reason, MEEN 436 was left as a prereq.**

**Tim Jacobs (tijacobs) (09/27/17 9:24 pm): Rollback: See email.**

**Tim Jacobs (tijacobs) (10/03/17 2:06 pm): Rollback: Per our email discussion, 10/3/2017.**

**Sandra Williams (sandra-williams) (10/03/17 3:59 pm): Update received.**

**Sandra Williams (sandra-williams) (12/04/17 3:54 pm): UCC approved in December.**

**Jan Helgoth (helgoth) (01/23/18 9:10 am): Rollback: To service course**

**Reported to state?**

Add
A. COURSE INFORMATION AND PREREQUISITES

Title and Number: AREN 440:500 AREN Heating, Ventilating, and Air Conditioning Design
Term: Fall/Spring
Meeting Times and Locations: TBD
Mode of Instruction: Lecture; Traditional, Face-to-Face
Credit Hour: 3 hr. (3-0)
Prerequisites: AREN 300 and AREN 330.

B. COURSE DESCRIPTION

This is a combined lecture and project-based design course, where the students will be able to select and develop the mechanical system for an actual building, from the programming phase to the design development and working documents. The emphasis of this course on the application of principles of HVAC in the design and analysis of a mechanical system in a real building. Topics covered include: review of building thermal load calculations & energy analysis; HVAC design goals and schematic design, system selection and system design; HVAC design development; HVAC design documents; energy, environmental, and human comfort considerations in HVAC design.

C. INSTRUCTOR INFORMATION

Name:
Phone Number:
E-mail Address:
Website: http://engineering.tamu.edu/aren
Office Hours:
Office Location:

D. STUDENT-INSTRUCTOR INTERACTION

The instructor-student interactions will take place through: 1) lecture session; 2) email inquiry and replies; and 3) appointments made through emails or phone calls.

E. TEXTBOOK

Required:

Reference Materials:
- American Society for Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) Handbooks- Fundamentals (2017); HVAC Systems & Equipment (2016); HVAC Applications (2015)

Additional references and materials will be provided through eCampus, email, or in class as needed during the semester.

F. COURSE LEVEL OUTCOMES

On successful completion of this course, the student will be able to:

1. Apply, working independently and in teams, standard architectural engineering problem solving techniques with minor levels of uncertainty and poorly defined problems.
3. Solve practical problems in a specialized technical area of interest - Heating, Ventilation, and Air-Conditioning - based on current practices or specifications.
4. Create a personal perspective on a specialized technical area, i.e., Heating, Ventilation, and Air-Conditioning.

G. PROGRAM LEVEL OUTCOMES

The course outcomes listed above target the following Program Level Outcomes of the Bachelor of Science in Architectural Engineering (http://engineering.tamu.edu/aren).

- **Tools for Architectural Engineering Problems**: Apply relevant knowledge, techniques, skills and modern engineering tools to identify, formulate and solve engineering problems (Outcome 7)
- **Technical Specialization**: Solve problems and analyze a complex system or process in one of the three program specialties – designing, building, and operating mechanical systems; designing and building structural systems; designing, building and operating electrical power and lighting systems – and state the process to become a specialist in this area (Outcome 12).

H. GRADING POLICIES

Exam- 20%
Participation/efforts/team skills- 35%
Design project & submission-40%
Assignments-5%

Exams
- Exams will be held in the assigned classroom.
- Exams will cover the topics discussed in the class. In order to be adequately prepared for the exams, students should read the relevant assigned material,
additional notes provided by the instructor or in the class, and class notes.

- Exams will typically be questions covering lecture materials from class.
- Makeup exam time (ONLY if allowed for an excused absence, see TAMU Student rule 7, not hunting, or a wedding, or a Disney trip, or…) will be arranged with the instructor and will consist of a comprehensive closed-book, closed-note format.

**Team Project**

- Will be announced in class

**Conversion of numerical grade to letter grade will be made as follows:**

<table>
<thead>
<tr>
<th>Numerical Grade</th>
<th>Letter Grade</th>
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<tr>
<td>90% and above</td>
<td>A</td>
</tr>
<tr>
<td>80% to below 90%</td>
<td>B</td>
</tr>
<tr>
<td>70% to below 80%</td>
<td>C</td>
</tr>
<tr>
<td>60% to below 70%</td>
<td>D</td>
</tr>
<tr>
<td>Below 60%</td>
<td>F</td>
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**I. CALENDAR OF TOPICS AND IMPORTANT DATES -**

  a. Though scheduled, instructor will verify exam dates & venue

<table>
<thead>
<tr>
<th>Week #1</th>
<th>Review of building thermal load calculations &amp; energy analysis</th>
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<tr>
<td>Week #2</td>
<td>HVAC equipment</td>
</tr>
<tr>
<td>Week #3</td>
<td>Design and control of HVAC Systems</td>
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<td>Week #4</td>
<td>Thermal comfort and indoor air quality</td>
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<td>Week #5</td>
<td>HVAC design goals and schematic design</td>
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<td>Week #6</td>
<td>System selection and system design - primary equipment</td>
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<tr>
<td>Week #7</td>
<td>System selection and system design - secondary equipment</td>
</tr>
<tr>
<td>Week #8</td>
<td>HVAC design development - detailed heating and cooling load calculations</td>
</tr>
<tr>
<td>Week #9</td>
<td>HVAC Design development – HVAC for mechanical room</td>
</tr>
<tr>
<td>Week #10</td>
<td>HVAC Design development – equipment space layout</td>
</tr>
<tr>
<td>Week #11</td>
<td>Design documents</td>
</tr>
<tr>
<td>Week #12</td>
<td>Design documents</td>
</tr>
<tr>
<td>Week #13</td>
<td>Revisions &amp; validation of HVAC design</td>
</tr>
<tr>
<td>Week #14</td>
<td>Design evaluation</td>
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J. **SPECIAL PROVISIONS**

1. **Americans with Disabilities Act (ADA) Policy Statement**
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Disability Services, located in the Disability Services Building at White Creek on west campus or call 979-845-1637. For more information, visit [http://disability.tamu.edu](http://disability.tamu.edu).

2. **Academic Integrity**
Misconduct in research or scholarship includes fabrication, falsification, or plagiarism in proposing, performing, reviewing, or reporting research. It does not include honest error or honest differences in interpretations or judgments of data. It is very important to read other people's work and to use their ideas in developing theses, professional papers, or otherwise completing academic requirements. This is called scholarship and is highly rewarded because it builds a cumulative body of knowledge. When other scholars share their ideas, they expect that others will give them credit when making use of their ideas. It is critically important for students to understand the rules for properly crediting other people's ideas when writing a thesis or professional paper or otherwise completing academic requirements.

If you use someone else's idea without using his or her specific words, this is called paraphrasing. When you paraphrase, you are expected to indicate the source of the idea (the author and publication date, but not a page number). This allows a reader to find the source of the ideas, verify that you have accurately represented them, and obtain additional information about those ideas if necessary. If you use someone else's exact words, this is called quoting. When you quote, you are expected to enclose the words in quotation marks, and indicate the source of the quote (the author, publication date, and page number). Plagiarism also applies to information found on the web; it is equally important to cite a web source and the rules above pertain. Consequently, if there are not quotation marks around the text and no source is cited, instructors will assume that you intend for them to conclude that any ideas, especially the specific words, that you presented in your work are your own. Thus, if the idea or the exact words are taken from another source and you do not indicate the source of the idea, you are representing another person's ideas as if they were your own. This is called plagiarism and is a very serious offense.

Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, is sufficient grounds to initiate an academic dishonesty case. For additional information please visit [http://aggiehonor.tamu.edu/](http://aggiehonor.tamu.edu/).

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations,
research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System.

3. Absences

Rules concerning excused absences may be found at http://student-rules.tamu.edu/rule07. In particular, except for absences due to religious obligations, the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. By state law, if a student misses class due to an obligation of his or her religion, the absence is excused. A list of days of religious obligation for the coming semester may be found at http://student-rules.tamu.edu/append4.

If an absence is excused, the instructor will either provide the student an opportunity to make up any quiz, exam or other work that contributes to the final grade or provide a satisfactory alternative by a date agreed upon by the student and instructor. If the instructor has a regularly scheduled make up exam, students are expected to attend unless they have a university approved excuse. The make-up work must be completed in a timeframe not to exceed 30 calendar days from the last day of the initial absence.

The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for the absence. Among the reasons absences are considered excused by the university are the following (see Student Rule 7 for details http://student-rules.tamu.edu/rule07). The fact that these are university-excused absences does not relieve the student of responsibility for prior notification and documentation. Failure to notify and/or document properly may result in an unexcused absence. Falsification of documentation is a violation of the Honor Code.

1) Participation in an activity that is required for a class and appears on the university authorized activity list at https://stuaconline.tamu.edu/app/sponsauth/index
2) Death or major illness in a student's immediate family.
3) Illness of a dependent family member.
4) Participation in legal proceedings or administrative procedures that require a student's presence.
5) Religious holy day. NOTE: Prior notification is NOT required.
6) Injury or illness that is too severe or contagious for the student to attend class.
   a) Injury or illness of three or more class days:
      Student will provide a medical confirmation note from his or her medical provider within one week of the last date of the absence (see Student Rules 7.1.6.1)
   b) Injury or illness of less than three class days:
      Student will provide one or both of these (at instructor’s discretion), within one week of the last date of the absence:
      (i.)Texas A&M University Explanatory Statement for Absence from Class form available at http://attendance.tamu.edu
      (ii.) Confirmation of visit to a health care professional affirming date and time of visit.
   c) An absence for a non-acute medical service does not constitute an excused absence.
7) Required participation in military duties.
8) Mandatory admission interviews for professional or graduate school that cannot be rescheduled.
9) Mandatory participation as a student-athlete in NCAA-sanctioned competition.
10) In accordance with Title IX of the Educational Amendments of 1972, Texas A&M University shall treat pregnancy (childbirth, false pregnancy, termination of pregnancy and recovery therefrom) and related conditions as a justification for an excused absence for so long a period of time as is deemed medically necessary by the student’s physician. Requests for excused absence
related to pregnancy should be directed to the instructor.

Other absences may be excused at the discretion of the instructor with prior notification and proper documentation.

In cases where prior notification is not feasible (e.g., accident or emergency) the student must provide notification by the end of the second working day after the absence, including an explanation of why notice could not be sent prior to the class.

Accommodations sought for absences due to the observance of a religious holiday can be sought either prior or after the absence, but not later than two working days after the absence.

4. **Disruptive Behavior**

If a student's behavior in class is sufficiently disruptive to warrant immediate action, the instructor is entitled to remove a student on an interim basis, pending an informal hearing with the Head of the Department offering the course. This hearing must take place within three working days of the student's removal. This rule and supporting information may be found at [http://student-rules.tamu.edu/rule21](http://student-rules.tamu.edu/rule21).

5. **Copyright**

Instructor reserves copyright to all materials used in this course. This means all materials generated for this class, which includes but is not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy any material, unless expressly granted written permission.

6. **Defacement of University Property**

"It is unlawful for any person to damage or deface any of the buildings, statues, monuments, trees, shrubs, grasses, or flowers on the grounds of any state institutions of higher education (Texas Education Code Section 51.204)". The words damage or deface refer specifically to any and all actions, whether direct or indirect, that either diminish the value or mar the appearance of the physical environment.