Fall 2017 Environmental Controls I : ARC 334K , ARI 324K

Instructor: Prof. Dr. Juliana Felkner
Office: GOL 2.212
Office hours: Friday 11:00 a.m. to 12:30 p.m.
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Course Time and Location: TTH 3:30 to 5:00 p.m., GOL 3.120
Lab Times and Location: F 9:00 a.m.-12:00 p.m. SUT 2.112 (sections 00770 and 00349)
W 6:00 p.m.-9:00 p.m. WMB 4.118 (section 00775)
W 6:00 p.m.-9:00 p.m. WMB 3.116 (section 00345)

Course Description

This course provides the essential architectural and technical understanding of daylighting, electrical lighting, electrical systems and acoustics, from both a quantitative and qualitative point of view. The goal is to provide architects, interior designers (and engineers, through collaboration) the skills to design comfortable, energy efficient, and healthy environments. A secondary but important goal is to introduce the students to experiential learning and interdisciplinary collaboration at an early stage in their careers.

Term Project

There will be one ongoing project during the course, which is done in interdisciplinary groups. Students will work in mixed groups of 5-6 on a real-world project on sustainable buildings in the Austin area and in collaboration with the stakeholders in the city of Austin. Details will be communicated at the beginning of the class.

Academic Learning Goals/Course Objectives

- Sustainable design
- Daylighting techniques
- Shading design and performance analysis
- Glazing strategies
- Accurate site analysis
- Electrical systems
- Electrical lighting
- Acoustic design
- Sound physics
- Sound physics
- Acoustic design

Text

Grondzik, Walter T.; Kwok, Alison G.; Stein Benjamin; Reynolds, John S. Mechanical and Electrical Equipment for Buildings, 12th Edition. Wiley, 2010. ISBN: 978-0-470-19565-9

References

Lechner, Norbert. Heating, Cooling, Lighting: Sustainable Design Methods for Architects. ISBN 978-1-118-58242-8

Minnaert, M.G. The Nature of Light and Colour in the Open Air, Dover, 1987. ISBN: 978-0-486-20196-2

Olgyay, Victor. Design with Climate: Bioclimatic Approach to Architectural Regionalism: New and expanded Edition With new essays by Donlyn Lyndon, Victor W. Olgyay, John Reynolds, & Ken Yeang. ISBN: 9780691169736

Tanizaki, Junichiro. In Praise of Shadows, Leete's Island Books, 1977. ISBN: 978-0-918172-02-0

Other references to be provided on course website.

Note: Please see the professor if you are unable to obtain a copy of any of the texts and will need to borrow a copy. The professor has a limited number of extras for this purpose.

Course Tools

- On-line Equidistant Projection Sun Charts at:
  http://solardat.uoregon.edu/PolarSunChartProgram.html
  http://www.gaisma.com

- Climate Consultant shareware (Mac and PC), download
  http://www.energy-design-tools.aud.ucla.edu

- Google Earth
  http://www.google.com/earth/download/ge/agree.html

- VELUX Daylight Visualizer, Manual 3D Modeler, free download.

*More may follow

Course Format

The course is composed of lectures presenting material to be used in the design exercises as well as the lab exercises. The exam will be based on material covered in the lectures. Lab exercise tasks will be presented to the students at the end of the lecture and are to be completed in groups during the lab sessions. Completed work is to be handed in at the end each lab session. The lab sessions will also provide students the opportunity to ask for feedback on their projects. One design project will be given during this course. Details of the assignments will be handed out during the semester

*__Acknowledgements:__ Special thanks go to Keith Simon and Mathew Tanteri for their selected readings and advice on this course, having previously taught it. They were very helpful in providing input.

Grading

Lab Exercises/Homework	20%
Project	25%
Exam 1	15%
Exam 2	30%
Attendance	10%

Grading is based on a 100 point scale as follows:

A 93-100
A- 90-92
B+ 87-89
B 83-86
B- 80-82
C+ 77-79
C 73-76
C- 70-72
D+ 67-69
D 63-66
D- 60-62
F 59 and below

Prerequisite: Successful completion of the course Architectural Interior Design 520L or Architecture 520L with a grade of at least C. For exceptions, talk with the professor.

UT Statements:

Attendance Policy
Attendance is mandatory in all lectures and labs. At the instructor's discretion, any student with more than 2 unexcused absences may be dropped from the class or the student's final grade may be lowered by one letter grade for each additional absence. Absences are excused only for medical conditions and personal or family emergencies. Written documentation will be required for any excused absence. A student who misses classes or other required activities for the observance of a religious holy day should inform the instructor as far in advance of the absence as possible, so that arrangements can be made to complete an assignment within a reasonable time after the absence. A student who fails to complete missed work within the time allowed will be subject to the normal academic penalties.

For Undergraduate Students: Quantitative Reasoning Flag
This course carries the Quantitative Reasoning flag. Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your professional life. You should therefore expect a substantial portion of your grade to come from your use of quantitative skills to analyze real-world problems.

Students with Disabilities
Students with disabilities who require special accommodations need to get a letter that documents the disability from the Services for Students with Disabilities area of the Office of the

Dean of Students (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). This letter should be presented to the instructor in each course at the beginning of the semester and accommodations needed should be discussed at that time. Five business days before an exam the student should remind the instructor of any testing accommodations that will be needed.

Behavior Concerns Advice Line (BCAL)
If you are worried about someone who is acting differently, you may use the Behavior Concerns Advice Line to discuss by phone your concerns about another individual's behavior. This service is provided through a partnership among the Office of the Dean of Students, the Counseling and Mental Health Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232- 5050 or visit http://www.utexas.edu/safety/bcal.

Policy on Academic Integrity
Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. For further information, visit the SJS website at http://deanofstudents.utexas.edu/sjs or call 471-2841.