

COURSE OUTLINE

COURSE CODE	ARCH246	COURSE LEVEL	Spring / 2019-2020
COURSE TITLE	Energy and Environmental Issues In Design		
COURSE TYPE			
LECTURER(S)	Assoc. Prof. Dr. Halil Z. Alibaba Office-Architecture Bldg., Rm.023 halil.alibaba@emu.edu.tr Office Tel: 630 1142		
CREDIT VALUE	(3+0+0) 3	ECTS VALUE	4
PREREQUISITES	None		
COREQUISITES	None		
DURATION OF COURSE	One semester (13 Weeks)		
WEB LINK			

CATALOGUE DESCRIPTION

A course to study the environmental factors influencing architectural design. Issues of climate, lighting and acoustics in relation to energy problems and user comfort. Climatic elements, classification of climates for architectural purposes, thermal process of human body, thermal comfort indexes, thermal process of buildings. Various climate control methods in buildings: thermal, solar, condensation, wind control and natural ventilation.

AIMS & OBJECTIVES

A course to study the environmental factors influencing architectural design. Issues of climate, lighting and acoustics in relation to energy problems and user comfort. Climatic elements, classification of climates for architectural purposes, thermal process of human body, thermal comfort indexes, thermal process of buildings. Various climate control methods in buildings: thermal, solar, condensation, wind control and natural ventilation.

GENERAL LEARNING OUTCOMES (COMPETENCES)

On successful completion of this course, all students will have developed **knowledge** and **understanding** of:

- energy and environmental issues,
- climate on macro and micro scale,
- thermal process of human body and thermal comfort,
- thermal process of buildings.

On successful completion of this course, all students will have developed **their skills in:**

- designing energy conscious buildings by controlling the climatic parameters,
- designing passive solar systems when needed,
- designing condensation free buildings,
- controlling sunshine, natural ventilation and wind in and around buildings.

On successful completion of this course, all students will have developed their appreciation of and respect for **values and attitudes** regarding the issues of: energy consciousness in architecture.

GRADING CRITERIA

Letter grading system is based on ranking the students according to their success in class. The students will be graded in terms of class average(**M**) and standard deviation(**SD**) of number grades, according to the following formulas. Only the lower limits of each letter grade are given below.

A	= M + 2 SD
A –	= M + 1.6 S
B+	= M + 1.3
B	= M + 1 SD
B –	= M + 0.7 SD
C+	= M + 0.35 SD
C	= M
C –	= M – 0.30 SD
D+	= M – 0.6 SD
D	= M – SD
D –	= M – 1.3 SD
F	= 0

RELATIONSHIP WITH OTHER COURSES

It is very much related to all the Design Studio courses because the skills obtained here will be used in them as well.

LEARNING / TEACHING METHOD

There will be regular lectures, problem solving applications, short quizzes. The lecture notes can be purchased at the beginning of the semester. They are also available on the web. Lecture notes will be projected to a screen. During the lecture and the students will be encouraged to ask questions and contribute to the discussions.

ASSIGNMENTS

Study of various climatic control elements by other architects and present them in class.

METHOD OF ASSESSMENT

(30% of the quizzes average + 30% of the midterm exam + 40% of the final exam) will make the final grade of the student.

ATTENDANCE

According to the university regulations students should attend at last 80% of the total lectures. Attendance will be taken at random times during the lecture hours.

TEXTBOOK/S

None

INDICATIVE BASIC READING LIST

- BROWN, G.Z., DEKAY, M., Sun, Wind & Light, Architectural Design Strategies. Second Edition. New York: John Wiley & Sons, Inc., 2001. ISBN 047134775.
- GALLO,C., Architecture: Comfort and Energy. New York: Elsevier Science, 1998. (EMU Library Catalogue No: 720.47 ARC, 1998 C.1.)
- GIVONI, B., Climate Considerations in Building and Urban Design. New York: Van Nostrand Reinhold, 1998. (EMU Library Catalogue No: 720.47 GIV, 1998.)
- OLGYAY, V. Design with climate. 2nd Edition. New Jersey: Princeton University Press,1963.
- OZDENIZ, M.B., Yapı Tasarımı İçin Türkiye İklim Verileri. Trabzon: 1984. (EMU Library Catalogue No: 721.046 OZD, 1984.)
- OZDENIZ, M.B., Mimari Yapıda Isı ve Yoğuşma Denetimi. Trabzon: TMMOB Mimarlar Odası Trabzon Şubesi Yayını,1987.(EMU Library Catalogue No:720.472 OZD,1987)
- SZOKOLAY, S.V., Environmental Science Handbook. Lancaster: The Construction Press, 1980.
- THOMAS, R., Environmental Design: An Introduction For Architects and Engineers. New York: E & FN Spon,1996. (EMU Library Catalogue No: 711 ENV, 1996.)
- WATSON, D., Climatic Design: Energy Efficient Building Principles and Practices.

New York: McGraw-Hill, 1983.(EMU Library Catalogue No: 697.9 WAT, 1983.)

EXTENDED READING LIST

- ANDERSON,B., Solar Building Architecture. Cambridge: MIT Press, 1990.
(EMU Library Catalogue No: 720.472 SOL, 1990.)
- BALCOMB, J.D., Passive Solar Buildings. Cambridge: MIT Press, 1992.
(EMU Library Catalogue No: 697.78 PAS, 1992.)
- BOURGES, B., Climatic Data Handbook for Europe. Boston: Kluwer Academic Publishers, 1992.(EMU Library Catalogue No: REF 551.527, CLI, 1992 C.1.)
- C.E.C., Solar Architecture In Europe. Bridport: Commission of European Communities,1991. (EMU Library Catalogue No: 720.472 SOL, 1991.)
- IPCC *Climate Change 1995: The Science of Climate Change*, (Eds J. T. Houghton, L. G. M. Filho, B. A. Callander, N. Harris, A. Kattenberg, and K. Maskell) Cambridge University Press, Cambridge, UK. 1996.
- IPCC *The Regional Impacts of Climate Change: An Assessment of Vulnerability*, (Eds RT Watson, MC Zinyowera, RH Moss), Cambridge University Press, Cambridge, UK., 1998.
- IPCC *Climate Change 2001: The Scientific Basis*, Cambridge University Press, Cambridge, UK. , 2001.
- I.E.A., Solar Low Energy Houses of IEA. London: Science Publishers, 1995
(EMU Library Catalogue No: 333.7923 SOL, 1995.)
- KELEŞ, M. Evaluation of mass housing of Northern Cyprus in respect to climatic design. Master's Thesis. Eastern Mediterranean University, Department of Architecture, Gazimağusa, 1998.
- LECHNER, N., Heating, Cooling, Lighting: Design Methods for Architects. New York: Wiley, 1991. (EMU Library Catalogue No: 697 LEC, 1991.)
- NOAA., <http://www.ncdc.noaa.gov/oa/climate/globalwarming.html> Global Warming, Frequently Asked Questions. National Oceanic and Atmospheric Administration web site.
- PALZ, W. Solar Energy Applications to Buildings and Solar Radiation Data. Dordrecht: Kluwer Academic Publishers, 1988.(EMU Library Catalogue No: 697.78 SOL, 1988.)
- PANCK, K., Solar Interiors: Energy Efficient Spaces Designed for Comfort. New York: Van Nostrand Reinhold, 1984.(EMU Library Catalogue No: 747.886 PAN, 1984.)
- SAYMANLIER, A., Climatic Aspects of Spaces in Cypriot Vernacular Architecture. M. Arch. Thesis. Gazimağusa: Eastern Mediterranean University, Faculty of Architecture, January 2001.
- SZOKOLAY, S. V., Introduction to Architectural Science: The Basis of Sustainable Design. Oxford: Architectural Press, 2004. (EMU Library Catalogue No:721 SZO, 2004)
- THOMAS, R., Environmental Design: An Introduction For Architects and Engineers. New York: E & FN Spon,1996. (EMU Library Catalogue No: 711 ENV, 1996.)
- UCS., <http://www.climatehotmap.org/index> Global Warming: Early Warning Signs. The Union of Concerned Scientists web site.
- WHITE, I.D., Environmental Systems. London: Chapman & Hall, 1992.
(EMU Library Catalogue No: 551.6 WHI, 1992.)

SEMESTER OFFERED

2019-2020 Spring Semester

CONTENT & SCHEDULE

Arch 246 lectures will be held on Tuesday Gr: 01 (08:30-11:20 am) in S04 and Wednesday Gr:02 (08:30 – 11.20 am) in S04.

The lecture topics were given in the following schedule:

WEEK	DATE	TOPICS
1	18Feb. – 19 Feb. 2020	Introduction to the course.
2	25 Feb. – 26 Feb. 2020	Energy issues in the world and its relation to architecture.

3	03 March. – 04 March 2020	Definition of climate, climatic elements. The ways climatic elements effect architectural design.
4	10 March – 11 March 2020	Climatic deviations due to topography and the other site conditions. Classification of climates for architectural purposes. Presentation of the climatic data in graphical form.
5	17 March – 18 March 2020	Thermal process of human body. Sensation of thermal comfort. Thermal comfort indices.
6	24 March – 25 March 2020	Thermal and condensation control in buildings. Thermal process of buildings. Thermal control in buildings.
7	31 March – 01 April 2020	Thermal process of buildings. Thermal control in buildings.
7	07 April – 08 April 2020	Mid-Term Jury Week
8	14 April – 15 April 2020	Mid-Term Exam Week
9	21 April – 22 April 2020	Holiday-Introduction to Sun Control and Shading device design.
10	28 April – 29 April 2020	Sun Control. Shading device design.- Holiday
11	05 May – 06 May 2020	Room Acoustics (Acoustic shadow, Sound level, Outdoor sound control, Reverbation time, Auditoriums for speech)
12	12 May – 13 May 2020	Room Acoustics (Acoustic shadow, Sound level, Outdoor sound control, Reverbation time, Auditoriums for speech)
13	19 May – 20 May 2020	Course Revisions
14	27 May – 29 May 2020	Final Jury Week
16	02 June – 03 June 2020	Final Exams Week

PLAGIARISM

This is intentionally failing to give credit to sources used in writing regardless of whether they are published or unpublished. Plagiarism (which also includes any kind of cheating in exams) is a disciplinary offence and will be dealt with accordingly.)

COME TO THE LECTURES IN TIME. ASK QUESTIONS ANY TIME DURING THE LECTURES.