

Zarqa University



Faculty of Engineering Technology
Department: Architectural Engineerir. ٤
Department
Course title: Systems of Environmental
Control 0908371

Prerequisite: 0908224

Instructor:

Lecture's time

Semester:

Office Hours:

Course description:

It concentrates on different climate conditions and its effect on the design process, temperature control inside buildings, shade measuring design and its utilities for defining the appropriate amount of insulation and shades, types of heat isolation, wind directions and ventilation in and outside building. Air conditioning by using passive system energy, Vernacular environmental solutions for regions of different climate.

Aims of the course:

The main aims of this course may be summarized as follow:

1. To be familiar with the fundamental scientific and definitions related to environment and environmental design>
2. To understand the relationship between man, climate and architecture>
3. To be able to know how to use climatic data in environmental design and control
4. Understanding solar geometry and how this is reflected on environmental design.

Intended Learning Outcomes (ILOs):

1. Knowledge and understanding

To build up abilities in environmental control and design.

2. Cognitive skills (thinking and analysis).

Develop personal abilities in design and that make him capable of dealing with environmental design requirements

3. Communication skills (personal and academic).

Architectural students will be able to communicate, read, use resources (books, magazine, web sites, etc.) related to environmental architecture, interpret and explain their requirements.

4. Practical and subject specific skills (Transferable Skills).

The course will train architectural students and qualify them for environmental control requirements using proper methods.



Course structures:

| Week | C. Hrs | ILOs | Topics | Teaching Procedure | Assessment methods |
|---------|--------|------|---|--------------------|--------------------|
| 2 weeks | 6 | | Definition environment –the meaning - elements- and its impact on the architectural design. | Lecture | |
| Week | 3 | | Environmental design through history | Lecture | |
| 2 weeks | 6 | | Climate and Climate Design - Climate elements - The general characteristics of the climate of the regions in the world - Climate Design | Lecture | |
| 1week | 3 | | Climate and man - thermal comfort and Thermal equilibrium | Lecture | |
| 2 weeks | 6 | | Shading and sun-breakers - Movement of the sun - Solar path maps - Sun-breakers | Lecture | |
| 2 weeks | 6 | | Natural ventilation and lighting - The benefits of natural ventilation and the most important elements that help the natural ventilation control - The benefits of natural lighting and the most important factors affecting it | Lecture | |
| 2 weeks | 6 | | Thermal properties of building materials - Thermal Conductivity - Radiation - Convection - Heat capacity and thermal insulation | Lecture | |

References:

- 1- the HOK Guidebook to Sustainable Design, J. Wiley & Sons , the Independent, UK 2005.
- 2- USA Green building Council, Version 2.2 New constracion and Major Renovation, 2007
- 3- Environmental science Handbook for Architects and Builders S.V. Szokolay, the construction press New York 1990.
- 4- Design with climate, Olgyay, V. Van Nosrand Rienhold, New York 1992.
- 5- فتحي، حسن، الطاقات الطبيعية والعمارة التقليدية، المؤسسة العربية للدراسات والنشر، بيروت 1988
- 6- وزيري، يحيى، التصميم امعماري الصديق للبيئة، مدبولي، 2003
- 7- استيته، كنعان، المرشد في التصميم المعماري المناخي، وزارة الطاقة والثروة المعدنية..
- 8- سمير، حسن المناخ والعمارة، الدار الجامعية للطباعة والنشر، عمان 1995.
- 9- كودة المباني الموفرة للطاقة، وزارة الأشغال العامة الأردنية، عمان 2009
- 10- العناصر المناخية والتصميم المعماري - الدكتور سعيد عبد الرحيم بن عوف-

Assessment Methods:

| Methods | Grade | Date |
|------------------------------|-------|------|
| First exam | 20% | |
| Second exam | 20% | |
| Participation and attendance | 10% | |
| Final Exam | 50% | |

