



Course Specification

— (Bachelor)

Course Title: **Environmental Control**

Course Code: **ME 399**

Program: **Architecture**

Department: **Architecture**

College: **Architecture and Planning**

Institution: **Qassim University**



1. Course Identification

Course general Description:

Introduction to the basic concepts of environmental control systems (i.e. energy, lighting and acoustics) that are used in buildings, including building fabric, building ventilation and human activities. The students learn the basic understanding in how to design an optimum control system of the internal environment.

- Energy

Provide the students with an understanding of basic principle of building energy performance including thermal performance in building that causes heat gain and heat loss. The cooling and heating load are introduced to with basic skills of how to enhance the energy efficiency in building by addressing the building fabric and ventilation system.

- Lighting

The lighting module is designed to provide the student with an understanding of architectural lighting in relation to building design and construction. The student is introduced to the field through exposure to various classes of light fittings, indices used in the specification of the color of the emissions of various lighting fixtures, calculation of simple artificial schemes and practical exercises.

- Acoustics

The acoustics module is designed to provide the student with an understanding of building acoustics in relation to building design and construction. The student is introduced to the field through acoustic history, practical measurements, sound insulation, reverberation, and noise, internal and external to the building.

Course Main Objective(s):

In this course, the students will:

- Understand how insulation, thermal mass and air movement effects the thermal performance of buildings
- Have a basic understanding of readily available Saudi code design tools used to compute thermal performance of buildings
- Be able to determine for simple designs, the required amounts of external opening required providing adequate internal illumination levels;
- Be able to carry out simple acoustic design, including construction specification;
- Be able to recognize when the acoustic environment is being modified during the design process.



2. Course Learning Outcomes (CLOs)

Code	Course Learning Outcomes	Code of CLOs aligned with program
1.0	Knowledge and understanding	
1.1	Recall the effects of thermal performance of buildings on Energy consumption.	K-1
1.2	Recognize the required amounts of adequate internal illumination (artificial light) levels.	K-1
1.3	Describe simple acoustic design.	K-3
2.0	Skills	
2.1	Estimate the energy consumption and illuminance level of basic space that has specific function.	S-2
2.2	Calculate the noise level and reverberation time in a specific space.	S-2
3.0	Values, autonomy, and responsibility	
3.1	Awareness of the sustainable aspects in energy, lighting and acoustic systems.	V-1

3. Students Assessment Activities

No	Assessment Activities *
1.	Quizzes, Practical assignments
2.	Mid-term exam
3.	Project (energy / acoustic)
4.	Final Exam





4. Learning Resources and Facilities

Essential References	Awbi, H. B. (2002). Environmental Science in Building, -Randall McMullan, Palgrave, Hampshire, UK, ISBN 0-333-94771-1. Building and Environment, 10(37), 1013
Supportive References	HVAC Systems Design Handbook, Roger W Haines et al, 1998. Heating, Cooling, Lighting Design Methods for Architects, Norbert Lechner, (John Wiley & Sons), New York. Plumbing, Cold Water Supplies, Drainage and Sanitation, F. Hall Third Edition, (Longman Scientific & Technical), 1994. Essential Building services, F. Hall Third Edition, (Longman Scientific & Technical), 1995.
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