



**Jordan University of Science and Technology**  
**Faculty of Architecture And Design**  
**Architecture Department**

ARCH452 Environmental Control Systems (2) Illumination And Acoustics

First Semester 2024-2025

**Course Catalog**

3 Credit Hours. Arch 452: Environmental Control Systems II- Illumination and Acoustics (3CH; 3H) The first part of the course concentrates on the physical characteristics of sound waves, propagation of sound, intensity, sound power units and measurement equipment?s. It teaches students how to design space acoustics based on its reverberation time, reflection, sound insulation, absorption and diffusion of sound, echo and flutter echo. Students also learn how to acoustically design auditoriums, halls, classrooms, and other architectural spaces. The second part of the course deals with daylight design, color and light, the functional requirements of lighting, calculation and design of daylighting. It also introduces different daylight estimation methods and their applications in architectural spaces. PQ: Arch 252 + Phy 101

**Teaching Method:** Blended

**Text Book**

<b>Title</b>	Mechanical and electrical Equipments for Buildings
<b>Author(s)</b>	Walter T. Grondzik and Alison G. Kwok
<b>Edition</b>	10th Edition
<b>Short Name</b>	Ref.1
<b>Other Information</b>	

**Instructor**

<b>Name</b>	Prof. Hussain Alzoubi
<b>Office Location</b>	A3L3
<b>Office Hours</b>	
<b>Email</b>	alzoubih@just.edu.jo

**Class Schedule & Room**

Section 1:  
 Lecture Time: Wed : 10:00 - 11:30  
 Room: A2124

**Prerequisites**

Line Number	Course Name	Prerequisite Type
2213530	ARCH353 Environmental Control Systems (1) Temperature And Humidity	Prerequisite / Study

**Tentative List of Topics Covered**

Weeks	Topic	References
Week 1	Introduction to lighting design, physics of light, Fundamental Laws of Light	
Week 2	Terminology and Definitions,	
Week 3	Candlepower Distribution and applications, Factors of Visual Acuity	
Week 4	Holophane Model, Direct glare (disability glare, discomfort glare)	
Week 5	Lighting software and light meters	
Week 6	Daylight Design Methods (DFM, IES methods)	
Week 7	Computer simulation and necessary software	
Week 8	Lighting systems, anidolic systems, light wells, light duct?.	
Week 9	Basic theory: sound and vibration, Inverse-square law, Sound propagation	
Week 10	Sound absorption, Reverberation time, Noise reduction	
Week 11	Sound transmission class and application	
Week 12	Speech privacy, Sound insulation	
Week 13	Room acoustics application and treatments.	
Week 14	Auditoria acoustical design	

Week 15	Final Exams Period	
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Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand basic concepts of lighting design [1A.A1]	20%	
Understand basic concepts of acoustical design [1A.A1]	20%	
understand lighting design methods and the related calculations [1A.A1]	20%	
understand lacoustical design methods and the related calculations [1A.A1]	20%	
Understand the relation between building parameters and illuminance levels [1A.A2]	20%	

Relationship to Program Student Outcomes (Out of 100%)																									
A.A1	A.A2	A.A3	A.A4	A.A5	A.A6	A.A7	A.A8	B.B1	B.B2	B.B3	B.B4	B.B5	B.B6	B.B7	B.B8	B.B9	B.B10	C.C1	C.C2	C.C3	D.D1	D.D2	D.D3	D.D4	D.D
80	20																								

Evaluation	
Assessment Tool	Weight
First Exam	25%
Second Exam	25%
Participation	10%
Final Exam	40%

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