

Building Physics - Syllabus

Course ID	02053201	Course Type	Professional compulsory
Credits	2	Prerequisite	None
Teachers	Peixian LI, Yujie WU, Xu WANG		
Class Time	Spring 2026, TUE 10:00-11:35		

1. Course Description

This course is a professional compulsory course for undergraduate students majoring in architecture. This course will teach students the basic theories of building physics as a foundation for future studies and design work. Building physics topics covered in this course encompass three aspects: thermal, lighting, and acoustics. Each aspect will be managed by one teacher.

2. Aims

This course aims to enable students to

- a) Understand the physical phenomena and design practices related to heat transfer and energy use in buildings, daylighting and electric lighting of buildings, and sound transmission in buildings;
- b) Apply numerical and computational evaluation methods to assess and improve the quality of the built environment; and
- c) Establish the concept of green and sustainable development and develop problem-solving skills.

3. Content overview

Week	Module	Topic	Teacher	Class arrangement
1	Thermal	Thermal Environment and Thermal Comfort	Peixian LI	Lecture
2		Thermophysics of Building Envelope		Lecture
3		Solar Radiation and Building Heat Gains		Lecture
4		Building Energy and Carbon		Lecture
5	Lighting	Lighting Basics	Yujie WU	Lecture
6		Human Vision and Perception		Lecture
7		Daylighting and Fenestration Systems		Lecture
8		Artificial Lighting and Pollution		Lecture
9	Acoustics	Fundamentals of Architectural Acoustics	Xu WANG	Lecture
10		Noise Control		Lecture
11		Room Acoustics		Lecture
12		Building Acoustics		Lecture
13	Applications	Visiting + Testing	All	Lab tour
14		Testing + Analyzing		Presentation
15		Analyzing		Presentation
16		Final paper exam		Paper exam

4. Scoring Scheme

Your final score of taking this course consists of two parts:

1. Online system score (55%)
 - (1) In-class activities like quiz and discussions (15%)
 - (2) Assignment 1: Group work – environmental performance test (20%)
 - (3) Assignment 2: Individual work – design reflection (20%)
2. Final paper exam (45%)
 - (1) Thermal exam (15%)
 - (2) Lighting exam (15%)
 - (3) Acoustics exam (15%)