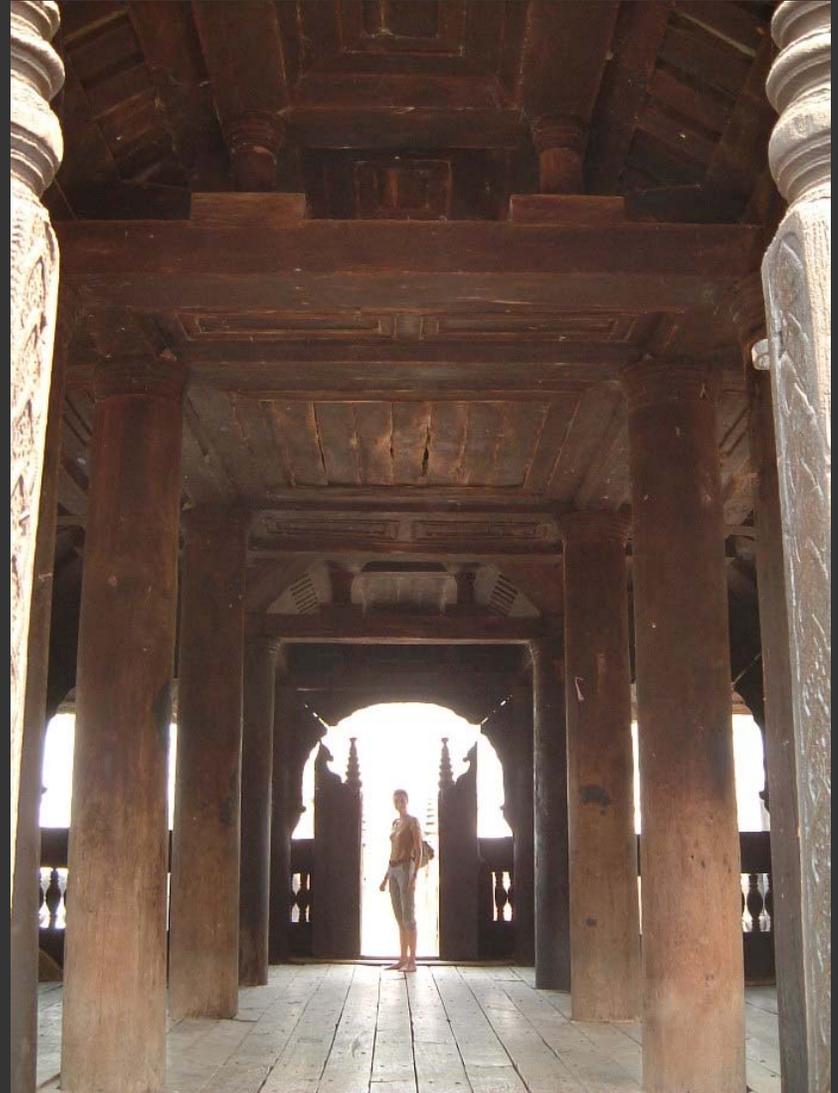


4.401 Introduction to Building Technology

Instructor: Marilyne Andersen



Course learning objectives

- ▶ Identify the environmental elements applying to buildings
- ▶ Recognize our human needs relating to buildings
- ▶ Propose ways to control the building's response to the outside environment
- ▶ Select the adequate design and materials for a given building configuration

Course contents

- ▶ Thermal aspects of a building
 - Outside environment and human needs
 - Heat and air flow
 - Humid air and thermal comfort
 - Passive heating and cooling
 - Thermal insulation
 - Condensation and moisture
 - Active heating, HVAC
 - Thermal balance

Course contents

- ▶ Thermal aspects of a building
- ▶ Lighting aspects of a building
 - Physics of light, photometry
 - Vision and colors, visual comfort
 - Design methods for sunlight and daylight
 - Case studies and window materials
 - Electric lighting

Course contents

- ▶ Thermal aspects of a building
- ▶ Lighting aspects of a building
- ▶ Acoustic aspects of a building
 - Sound and hearing
 - Sound insulation
 - Room acoustics

Course contents

- ▶ Thermal aspects of a building
- ▶ Lighting aspects of a building
- ▶ Acoustic aspects of a building
- ▶ Construction methods
 - Foundations
 - Wood
 - Steel
 - Masonry and concrete

Assignments

- ▶ Participation and homework 40%
 - problem sets, reading assignments
 - building analyses
- ▶ In-class quizzes 30%
 - March 22, May 10
 - 1h30'
- ▶ Design project 30%
 - selection of building
 - 3 parts: thermal balance, lighting and acoustic analysis, proposal for a relocation of the building in a different climate
 - teams of 2
 - short written reports (3-5 pages)

Building functions as an integrated system

▶ Any design decision has repercussions on many other issues

choice of materials ...



thermal properties
acoustics
lighting ...



wiring, piping ...



structural resistance,
fire protection,
maintenance ...

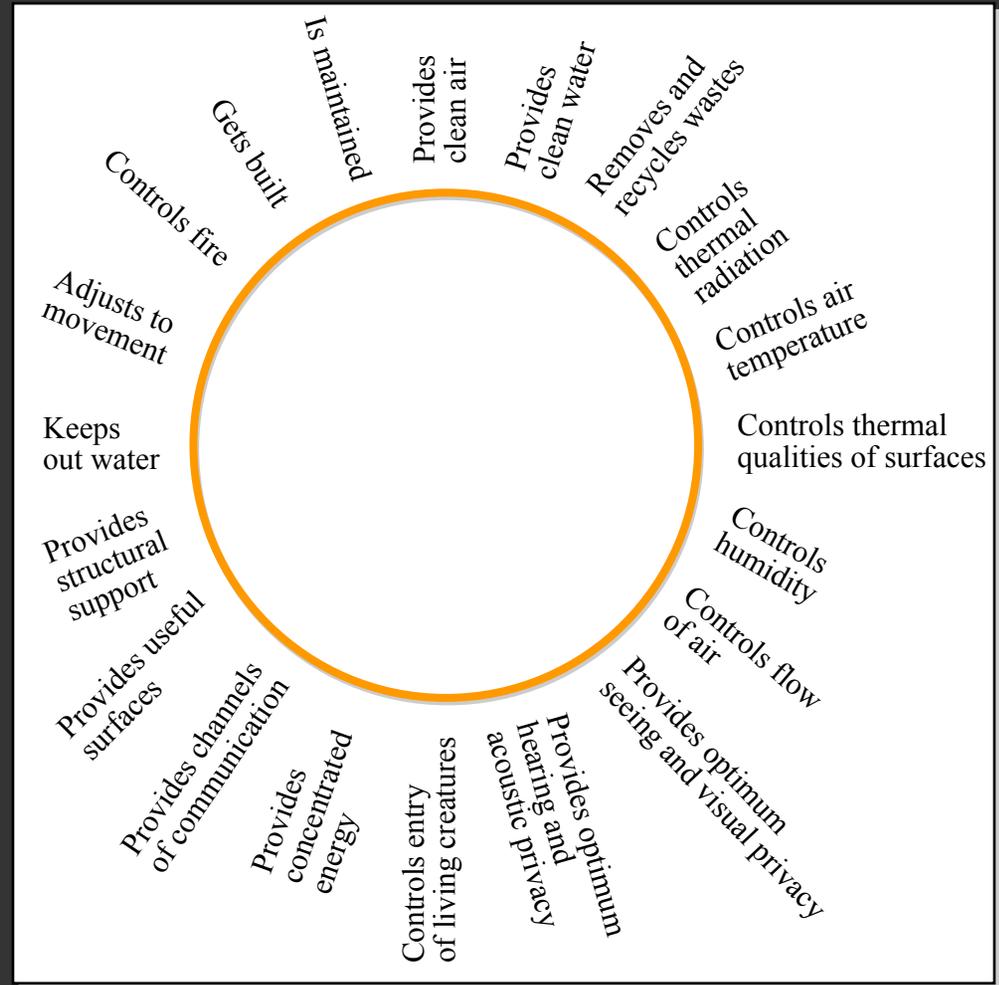


Figure by MIT OCW.