

**Cursus** : Génie civil

**Titre** : Fundamentals of indoor climate

**Coefficient** :

**Langue** : Anglais

**Session** :

**Semestre** : Automne

**Examen** : Écrit

**Charge** :

**Semaines** : 14

**Heure hebdo** : 2 h

- **Cours** : 1 h
- **Exercice** : 1 h

### REMARQUE / REMARKS

Type of assessment: During the semester

### RESUME / SUMMARY

The indoor climate impacts building performance and human well-being. This course covers fundamental knowledge of indoor air quality and thermal environment, along with their assessment methods. It also outlines strategies for creating comfortable, healthy, and energy-efficient spaces.

Le climat intérieur affecte la performance des bâtiments et le bien-être humain. Ce cours couvre les bases de la qualité de l'air intérieur et de l'environnement thermique, ainsi que leurs méthodes d'évaluation. Il présente aussi des stratégies pour créer des espaces confortables, sains et écoénergétiques.

### CONTENU / CONTENT

Theory lectures: Introduction to topics that are fundamental to building climate, such as: Human and the physical environment, indoor environmental quality, heat transfer in buildings, psychrometric processes, indoor air quality, thermal environment, thermal comfort, building HVAC systems, types of ventilation, room air distribution, indoor environment and energy, existing standards and guidelines for indoor environment.

Group assignment: Through the course project, the students will work in a group of ~4-6 to prepare one topic related to the course content. The topic will be presented in with oral presentation through PPT slides that will be accompanied by feedback session by peers and the teacher, where the students will discuss the topics and lessons learnt. The aim of the course assignment is to deepen students' familiarity on contemporary indoor climate issues and trends, as well as to encourage students to think about this topic in a broader scientific and societal context, introduce you to the writings of leading experts in the field, and give them practice of oral presentation and creating of interesting and visually stimulating PPT slides.

### MOTS-CLES / KEYWORDS

Indoor environmental quality, building design, building systems, human comfort and health

### COMPETENCES REQUIRES / LEARNING PREREQUISITES

- Cours prérequis obligatoires : None
- Cours prérequis indicatifs : Cliquez ici pour entrer du texte.
- Concepts importants à maîtriser : Indoor environmental quality, Building physics, Building systems, Heat transfer.

### ACQUIS DE FORMATION / LEARNING OUTOMES

A student who has met the requirements of this course will be able to:

- Account for the impact of building design and operation on the quality of indoor environment, human health and comfort.
- Identify control strategies that contribute to the improvement of building climate.
- Carry out a project in groups and present the work in a form of an oral presentation

### **COMPÉTENCES TRANSVERSALES / TRANSVERSAL SKILLS**

The students will gain the following transversal skills:

- Assess and plan their on-going learning goals.
- Identify and critically analyse relevant scientific literature and technical documentation.
- Make an oral presentation.
- Work in team, receive and respond to feedback.

### **MÉTHODE D'ENSEIGNEMENT / TEACHING METHODS**

This course consists of theory lectures complemented with group assignments.

### **TRAVAIL ATTENDU / EXPECTED STUDENT ACTIVITIES**

To actively participate in lectures to understand basic theory, and to write and present a group assignment.

### **MÉTHODE D'ÉVALUATION / ASSESSMENT METHODS**

Written exam on the theoretical bases: 60%

Group assignment with oral presentation: 40%

### **ENCADREMENT / SUPERVISION**

- |                                      |     |
|--------------------------------------|-----|
| • Office hours (by appointment only) | Yes |
| • Assistants                         | Yes |
| • Forum                              | No  |

**RESSOURCES / RESOURCES**

- Bibliographie  
Peer-reviewed papers and websites – it will be provided throughout the semester
- Ressources en bibliothèque  
C-A Roulet. Santé et qualité de l'environnement intérieur dans les bâtiments.
- Polycoplés
- Sites web
- Liens moodle
- Vidéos

**PRÉPARATION POUR / PREREQUISITE FOR**

[CIVIL 407: Energy and Comfort in Buildings](#)