

Course Syllabus

Energy Efficiency in Buildings

1. Description

This course consists of four modules that, together, provide an introduction to energy efficiency in buildings. It is a comprehensive tutorial, meant to engage and challenge students to consider the many decision levels and options involved in advancing energy efficiency in buildings. The course covers the fundamental technical, design, policy and financial dimensions necessary to practically engage on the topic.

Energy efficient buildings are a cornerstone of a prosperous, sustainable and healthy society. This course aims to prepare participants to successfully advance energy efficient building construction and retrofits by equipping them with an understanding of the buildings landscape.

2. Target Groups and Participants

The approach is both cross-disciplinary and practical, applying foundational concepts to real-world examples. The course has been developed with a strong policy perspective, and therefore is particularly suited for policymakers. At the same time, it is meant to benefit anyone with an interest in the topic including: architects, engineers, financial institutions, think-tanks, university students, and citizens.

Participants in the course will, on completion, have a solid understanding of the “big picture” as well as the tools to leverage their own expertise and interest to contribute to advancing energy efficiency in buildings.

3. Learning Objectives

The main objective of the course is to introduce students to the fundamentals of energy efficiency in buildings. This is accomplished by applying theory to practice, drawing on experience across the world to prepare students to apply what they have learned.

Specific objectives:

The course covers technical, legal, financial and practical aspects of energy efficiency in buildings with the goals of:

- providing participants with a vision of the “big picture”,
- providing enough details to engage productively on any of the topics, and
- providing resources for information and collaboration.

With this course, the IEA hopes to educate and motivate the next generation of citizens and professionals dedicated to improving the built environment.

On completion of the course, students will be able to answer the following questions:

- What is meant by energy efficiency in buildings?
- What technologies and design options can advance energy efficiency in buildings?
- What policies can be used to reduce energy use in buildings, and enable effective investment and finance for energy efficiency in buildings?
- What is the role of codes and standards, and how can they be structured to promote energy efficiency in buildings?
- How can energy efficiency be measured, evaluated and verified?
- Who are the various actors involved, and how can they be productively engaged?
- What are some additional resources to advance my own work on energy efficiency in buildings?

4. Methodology

This course is based on the MOOC model (massive online open course), which means that its content and activities are available through Open edx platform 24 hours a day, 7 days a week, providing flexibility in time and space to review the material and learn at your own pace based on the work schedule of each participant. The course lasts approximately 40 hours, distributed in 4 thematic modules that can be taken in a total of 6 weeks.

Each participant is in charge of managing their learning process. This implies that, as a participant, it is your responsibility to follow the course contents in order, set your own pace and dedicate appropriate time and attention to the course materials. You should review the videos, do the readings and answer the evaluations. We suggest taking notes of the contents of the modules and lessons. This will help prepare you for the evaluations at the end of each module and will also serve as personal material for the future.

We recommend investing a few minutes of learning each day in the course, in a comfortable place without distractions. The most important thing is the quality of time spent and not the quantity. Each participant will decide how to invest and distribute the time they will devote to their professional improvement.

5. Content and Activities

This course is structured in 4 modules. Each module has several sub-themes, and each sub-theme is divided into several lessons. All modules will be available for students from the first day of the course. It is recommended to access all modules and all lessons in chronological order to achieve comprehensive training as the lessons are structured to build on each other.

MODULE I – Introduction to energy efficiency in buildings

- 1.1 Understanding building energy use
- 1.2 Energy efficiency potential in buildings
- 1.3 Energy efficient building design
- 1.4 Energy efficient building technologies
- 1.5 Special session: cooling comfort in hot climates

MODULE II – Implementing energy efficiency

- 2.1 Energy efficiency policies
- 2.2 Target setting and stakeholder engagement
- 2.3 Building codes and standards
- 2.4 Energy efficient building operation

MODULE III – Measuring energy efficiency

- 3.1 Data and energy efficiency indicators
- 3.2 Evaluation of energy efficiency

3.3 The multiple benefits of energy efficiency

MODULE IV - Enabling investment in energy efficiency

- 4.1 Energy efficiency investment
- 4.2 Enabling investment through policy
- 4.3 Enabling investment through project standardization
- 4.4 Enabling investment through procurement
- 4.5 Enabling investment through funding, finance and fiscal instruments
- 4.6 Enabling investment through energy markets

6. Evaluation

Each module has a mandatory evaluation or activity that the participant must perform in order to complete the module.

From modules 1 to 4 there will be a final mandatory evaluation of the contents. These evaluations are 7 questions with 60 minutes to answer once it starts. To pass these evaluations, you need to answer at least 57% of the 7 questions correctly.

Each participant has 8 attempts to pass each of the assessments. To pass the course the participant must pass all the evaluations.

7. Certification

At the end of the course, participants will receive a certificate. The certificate is issued when the student has participated in at least an average of 75% of the course modules. This average is calculated by dividing the sum of the % of each module, by the number of modules in the course. It recognizes the student's participation in the course, access to the material of each lesson and / or fulfillment of the activities (mandatory or not). The certificate can be downloaded as a diploma in PDF format.

8. Contact

Energy.efficiency@iea.org