Building energy modelling (BEM) - BMEEOEMDT87

I. Subject Specification

1. Basic Data

1.1 Title

Building energy modelling (BEM)

1.2 Code

BMEEOEMDT87

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	2

1.5 Evaluation

Exam

1.6 Credits

3

1.7 Coordinator

name	Dr. Szalay Zsuzsa
academic rank	Associate professor
email	szalay.zsuzsa@emk.bme.hu

1.8 Department

Department of Construction Materials and Technologies

1.9 Website

https://epito.bme.hu/BMEEOEMDT87
https://fiek2.mywire.org/course/view.php?id=2516

1.10 Language of instruction

english

1.11 Curriculum requirements

Ph.D.

1.12 Prerequisites

1.13 Effective date

1 September 2022

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2. Objectives and learning outcomes

2.1 Objectives

The goal of the subject is to give an overview on energy calculation based on Building Information Modelling (BIM). Building Energy Modelling (BEM) assists the design of low energy and sustainable buildings and provides information on the comfort and energy use of buildings. Students will learn how to conduct a dynamic energy simulation and evaluate energy efficiency measures.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. understands the energy balance of a building,
2. is informed about building energy calculation methods,
3. has a knowledge about the connection of Building Information Models and energy calculation,
4. knows the main parameters influencing the energy balance of buildings,
5. is able to build an energy model of a building,
6. has an overview about possible energy saving measures.

B. Skills

1. efficiently uses information sources for learning (study aids, lecture notes, internet),
2. applies the basic design principles to save energy in buildings,
3. understands the methods for calculating energy use and comfort in buildings,
4. is able to interpret the results of building simulation,
5. is able to use energy calculation software tools.

C. Attitudes

1. is open to sustainable architecture and environmentally conscious thinking,
2. cooperates with the teacher and students to gain knowledge,
3. is willing to expand knowledge through continuous learning and is open to new learning methods,
4. strives to use professional terminology.

D. Autonomy and Responsibility

1. can prepare a task individually or in a small group,

2. is open to well-founded criticism.

2.3 Methods

Lectures, seminars, written and oral communication, IT tools and techniques, individual and group work.

2.4 Course outline

Hét	Előadások és gyakorlatok témaköre
1.	Introduction, energy calculation methods in buildings
2.	Basic principles of heat balance in buildings
3.	Geometry modelling
4.	Principles of zoning
5.	Activities, occupancy, set-points
6.	Modelling of building constructions
7.	Modelling of openings and shading, surroundings
8.	Time schedules, user profiles
9.	Natural ventilation
10.	Modelling of HVAC systems and lighting
11.	Simulation outputs and interpretation
12.	Consultation of student works
13.	Summary
14.	Presentations of student works

The above programme is tentative and subject to changes due to calendar variations and other reasons specific to the actual semester. Consult the effective detailed course schedule of the course on the subject website.

2.5 Study materials

a) Books:

1. Clarke, J.A.: Energy Simulation In Building Design, Butterworth-Heinemann, Oxford, 2004.
2. Hensen and Lamberts (ed.): Building Performance Simulation for Design and Operation, Spon Press, 2011.

b) Electronic materials at edu.epito.bme.hu

2.6 Other information

The use of a private laptop is recommended. Presence at 70% of the classes is compulsory.

2.7 Consultation

Consultation time:

according to the information on the department website, or

agreed in e-mail: szalay.zsuzsa@emk.bme.hu

Building energy modelling (BEM) - BMEEOEMDT87

This Subject Datasheet is valid for:

Inactive courses

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II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

3.2 Assessment methods

Teljesítményértékelés neve (típus)	Jele	Értékelt tanulási eredmények
		A.1-A.6; B.1-B.5; C.1-C.4; D.1-D.2

The dates of deadlines of assignments/homework can be found in the detailed course schedule on the subject's website.

3.3 Evaluation system

Jele	Részarány
Összesen	**100%**

3.4 Requirements and validity of signature

3.5 Grading system

Érdemjegy	Pontszám (P)
jeles (5)	
jó (4)	
közepes (3)	
elégséges (2)	
elégtelen (1)	

3.6 Retake and repeat

3.7 Estimated workload

Tevékenység	Óra/félév
Összesen	

3.8 Effective date

1 September 2022

This Subject Datasheet is valid for:

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