



ENERGY SIMULATION OF HIGH PERFORMANCE GREEN BUILDINGS

FOR ENERGY AND GREEN BUILDING SPECIALISTS

KRISHNAJI PAWAR, LEED AP BD+C, GSAS CGP, ISO 14001:2015, GCP
ENERGY SPECIALIST CURRICULUM





INTRODUCTION AND COURSE OUTLINE

FOR ENERGY AND GREEN BUILDING PROFESSIONALS

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KRISHNAJI PAWAR
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ONLINE TRAINING COURSE

ENERGY SIMULATION OF HIGH PERFORMANCE GREEN BUILDINGS

ENERGY SPECIALIST CURRICULUM

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LEARNING OBJECTIVES



- Learn Green Building Rating System
- Understand Green Building Basics
- Leadership in Energy and Environmental Design - LEED
- Learn Building Energy Codes and Standards
- Energy Issues and Policy
- Passive Architecture
- SUN Shading Analysis
- Lighting simulation and whole Building Energy Simulation
- The Process of Carrying out Energy Simulation
- BAS System Specification and Energy Efficiency Measure and Retrofits



WHO IS THIS COURSE FOR?

This course is designed to help energy professionals, including energy managers, energy engineers, facility and business managers, industrial engineers, supply chain professionals, utility officials, consultants, contractors, financial officers, and energy service company professionals become more aware of and effective at identifying and implementing the best energy management strategies.

Building Professionals who want to learn more about Energy Management and Energy Efficiency.

For those who are starting their journey in the Energy Management and Energy Efficiency Profession.



KEY TAKEAWAYS

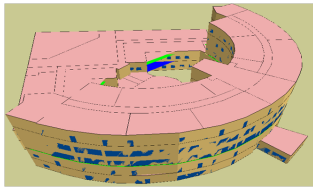
- Understand Green Building Basics
- Learn Building Energy Codes and Standards
- Energy Issues and Policy
- Lighting simulation and whole Building Energy Simulation
- The Process of Carrying out Energy Simulation
- BAS System Specification and Energy Efficiency Measure and Retrofits
- Work through practical examples to demonstrate the topics and procedures covered.
- Energy Modeling for High Performance Green buildings



**GET READY TO ENERGY SIMULATION
OF HIGH PERFORMANCE GREEN
BUILDINGS
KNOWLEDGE AND ENROL NOW!**

WHY IS ENERGY MODELING IMPORTANT?

As technology advances, Building Energy Modeling (BEM) becomes more of a really valuable tool. According to statistics presented by the National Institute of Building Sciences, the demand for high-performing and energy-efficient buildings is continually on the rise.



This brings us to early-stage energy modeling. With energy modeling, you will be able to have an estimate of the total energy consumption of a building and assess its potential energy savings. However, what exactly are the benefits when energy modeling is done early on?

ENERGY MODELING OR SIMULATION

Before we talk about early-stage energy modeling benefits, let's first have a quick overview of what energy modeling is.

Energy modeling is basically a process used to estimate the possible energy expenditure of a building by factoring in its mechanical systems, construction materials, specific site characteristics, average local climate conditions, and expected occupant requirements. It's used to evaluate how various systems within a building interact.

Through energy use estimates, energy modeling will be able to determine the best system integration possible. As a result, designers can come up with strategies that will help a building enhance its overall system performance.

Before the introduction of Building Energy Modeling software, energy modeling used to be a complicated and time-consuming process without any significant cost-saving on projects both small and large.

WHY ENERGY MODELING MATTERS?

A common misconception regarding energy modeling is that energy models are used only by engineers as a means of viewing energy statistics and code compliance.

Energy modeling is basically a process used to estimate the possible energy expenditure of a building by factoring in its mechanical systems, construction materials, specific site characteristics, average local climate conditions, and expected occupant requirements. It's used to evaluate how various systems within a building interact.

However, this might have been true before the US Green Building Council was established. Prior to that, mechanical engineers use modeling techniques as a means of determining a building's performance characteristics as well as its cooling and heating loads.

Nowadays, however, BEM tools are being used by architects as well. Instead of just focusing on HVAC systems, designers can use the tool for evaluating the various components of a building such as air conditioning usage, access to daylight, and more.



WHY ENERGY MODELING MATTERS? +

That being said, energy modeling is capable of providing the following benefits:

✓Engineers and architects alike can set specific energy-efficiency goals for their clients

✓It can be used to help projects obtain LEED certification

✓It's possible to measure specific HVAC and lighting usage which, in turn, can satisfy LEED requirements in those fields

✓Design professionals will be able to estimate a building's future energy usage and cost

While energy modeling comes with these benefits, doing it early on in the building design process can actually be a lot more advantageous due to a number of reasons. Ideally, the process of energy modeling should be implemented on a project's earliest stages, and here are the reasons why:



WHY ENERGY MODELING MATTERS? +

✓It makes achieving energy-efficiency and LEED certification goals a lot easier

✓When done during the pre-design phase, a building project can achieve up to 45% energy savings on average as opposed to a baseline building

✓Designers can decide on which systems and components to install as a means of optimizing a building's energy-efficiency.

✓If the project owner is considering solar power or any other generation technology, energy modeling results can be used to optimize capacity.

✓Various delays, risks, and setbacks can be addressed in advance, thereby eliminating the need for a redesign later on



WHY ENERGY MODELING MATTERS? +

A lot of experts tend to view energy modeling as both art and science. Beyond just choosing the right modeling software, the skills of a licensed engineer or architect are paramount in order to make full use of energy modeling.

While the modeling software is deemed the principal tool in energy modeling, it will be up to the skills and experience of the design professional you choose.





WHY DO WE NEED ENERGY MODELING SOFTWARE?

- ✓ In 2018, the residential and commercial sectors accounted for about 40% (or about 40 quadrillion British thermal units) of total U.S. energy
- ✓ Opportunity exists for project teams to utilize energy modeling software to help evaluate design decisions in terms of life-cycle cost impacts in order to maximize building performance
- ✓ Building energy performance is a function of numerous, interdependent internal and external factors, such as material selection, mechanical and electrical systems, solar orientation, climate, and occupant usage
- ✓ Modification of various design components can produce complex interactions that are difficult to analyze in isolation
- ✓ Building energy simulation softwares provide tools for evaluating energy impacts across dynamic interrelated systems







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