

Building Energy Simulation Workshop

From first principles in EnergyPlus to hands-on design evaluation on GRIHA benchmarks

Dates: 18th & 19th September | **Venue:** TERI Seminar Hall, IHC | **Mode:** In-person · Lectures + Live Demo + Hands-On

About the Programme

Every high-performance building begins with a question: how will this design actually perform? Building energy simulation answers that question before construction begins and it sits at the heart of GRIHA's performance-based approach to energy optimisation. Yet for most students of architecture and engineering, simulation remains a black box: frequently discussed in the classroom, rarely practised hands-on.

This two-day programme opens that box. **Day 1** shall build the foundations i.e., the physics, the logic and the anatomy of a whole-building energy model and then walking, step by step, through how a model is actually constructed in EnergyPlus™, the open-source simulation engine developed by the U.S. Department of Energy that powers professional compliance workflows worldwide: envelope and shading, internal gains from occupancy, lighting and equipment, exterior loads, infiltration, HVAC zoning and systems, and the interpretation of results.

Day 2 shall move from engine to application. Participants will experience a live demonstration of the **Building Investment Grader (B.I.G)** i.e., a guided, browser-based application that converts design inputs into a complete EnergyPlus model and evaluates the design against GRIHA benchmarks followed by a mentored hands-on studio in which every participant shall model and evaluate a building design on their own laptop. In two days, participants shall go from first principles to a benchmarked building which is an experience that otherwise takes weeks of self-learning.

What You Will Learn

- **The physics behind the model** — heat transfer, climate and weather data, and thermal comfort, and how they come together in a whole-building energy simulation.
- **The complete EnergyPlus workflow** — building envelope and shading; internal gains from occupancy, lighting and equipment; exterior lighting and equipment; infiltration; and HVAC zones and systems.
- **Result interpretation** — reading EPI, end-use breakdowns and system performance the way an evaluator does.
- **The GRIHA connection** — where simulation feeds the rating's energy criteria and what appraisal-ready analysis looks like.
- **Hands-on capability** — using the Building Investment Grader (B.I.G) to take a design from inputs to a GRIHA benchmark evaluation in a single sitting.

Why You Should Attend

- **An industry-relevant skill:** energy modelling is among the most sought-after capabilities in India's green building consulting and design practice which is central to GRIHA compliance.
- **Learn from practitioners:** sessions are led by practising simulation experts and GRIHA evaluators who work on real certification projects.
- **Do, don't just watch:** a dedicated hands-on studio ensuring every participant personally models and evaluates a building which is a rarity in two-day formats.
- **Certificate of Participation** from GRIHA Council.

- **Studio-scale batch:** seats are limited to keep the participant-to-mentor ratio conducive to individual attention.

Who Should Attend

Professionals and practitioners from consulting and industry who want a structured, practical grounding in simulation-based design evaluation for GRIHA projects.

Undergraduate and postgraduate students of architecture; civil, mechanical and electrical engineering; building science, energy and allied disciplines.

No prior exposure to simulation software is assumed.

What to bring: a laptop with an up-to-date web browser is essential for the Day 2 hands-on studio. Pre-read material and the sample design brief will be shared with registered participants ahead of the programme.

Programme Agenda

Day 1 – Foundations & the EnergyPlus Modelling Workflow

Time	Session	Key Coverage
09:30 – 10:00	Registration & Welcome Kit	Participant check-in and distribution of programme material.
10:00 – 10:20	Inaugural Session	Welcome address and programme overview by GRIHA Council: why simulation sits at the core of green building certification.
10:20 – 11:30	Session 1 - Fundamentals of Building Energy Simulation	Energy in the Indian building sector; heat transfer and building physics essentials; climate zones, weather data and thermal comfort; anatomy of a whole-building simulation; the simulation engine landscape and where EnergyPlus fits.
11:30 – 11:45	<i>Tea Break</i>	
11:45 – 13:00	Session 2 - Simulation in the Certification Context	Energy Performance Index (EPI) and benchmarks; the baseline vs. proposed design concept; where simulation feeds GRIHA's energy criteria and appraisal documentation; common modelling pitfalls; a first look inside an EnergyPlus model.
13:00 – 14:00	<i>Lunch</i>	
14:00 – 15:30	Session 3 - Building the Model I – Envelope, Shading & Internal Gains	Thermal zoning and geometry; defining walls, roofs and glazing (U-factor, SHGC, window-to-wall ratio); shading devices and their impact; internal gains from occupancy, lighting and equipment; schedules and diversity.
15:30 – 15:45	<i>Tea Break</i>	
15:45 – 17:15	Session 4 - Building the Model II – Exterior Loads, Infiltration, HVAC & Results	Exterior lighting and exterior equipment; infiltration and ventilation; defining HVAC zones; HVAC system types and templates; running the simulation; interpreting results – EPI, end-use breakdown and unmet hours.

Time	Session	Key Coverage
17:15 – 17:30	Day 1 Wrap-Up	Key takeaways and open Q&A.

Day 2 — From Engine to Application: Evaluating Designs on GRIHA Benchmarks with B.I.G

Time	Session	Key Coverage
09:30 – 10:00	Recap & Warm-Up	Interactive recap of Day 1 concepts.
10:00 – 11:30	Session 5 • B.I.G Live Demonstration I — Setting Up the Building	Introducing the Building Investment Grader (B.I.G); project setup and climate selection; floor-plan-first geometry; envelope, glazing and shading definition.
11:30 – 11:45	<i>Tea Break</i>	
11:45 – 13:00	Session 6 • B.I.G Live Demonstration II — Loads, HVAC & GRIHA Evaluation	Internal loads and schedules; HVAC system selection; running the evaluation; reading results against GRIHA benchmarks; live what-if analysis — improving the design in real time.
13:00 – 14:00	<i>Lunch</i>	
14:00 – 15:45	Session 7 • Hands-On Studio	Participants model a sample design brief in B.I.G on their own laptops with mentored support and evaluate the design against GRIHA benchmarks.
15:45 – 16:00	<i>Tea Break</i>	
16:00 – 17:00	Session 8 • Results Round-Up & Open Discussion	Participants present their evaluations; comparing design decisions and their energy impact; open discussion on careers in energy modelling and the GRIHA certification pathway.
17:00 – 17:30	Valedictory Session	Participant feedback, certificate distribution and closing remarks.

The agenda is indicative. Session timings and resource persons may be marginally refined; registered participants will receive the final schedule in advance.