# Thermal Comfort Optimization Training Course

Professional Development Training Course Outline

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|---|---|---|---|
| **Category** | Architectural Engineering | **Duration** | 5 Days |
| **Base Fee** | $1,500 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

Thermal Comfort Optimization is a critical discipline in modern building performance engineering, sustainable architecture, and energy-efficient HVAC system design. It focuses on achieving the ideal balance between indoor environmental conditions such as temperature, humidity, air velocity, and radiant heat to maximize occupant comfort, productivity, and energy efficiency. With rising global temperatures and increasing demand for green buildings, optimizing thermal comfort has become a key priority in smart building design, net-zero energy buildings, and climate-responsive architecture.

Thermal Comfort Optimization Training Course equips participants with cutting-edge knowledge and practical skills in thermal comfort modeling, adaptive comfort standards (ASHRAE 55, ISO 7730), computational fluid dynamics (CFD), and building energy simulation tools. Learners will explore real-world applications of HVAC optimization strategies, passive cooling techniques, and indoor environmental quality (IEQ) enhancement. The course integrates data-driven decision-making, AI-based building analytics, and sustainability principles to enable professionals to design and operate buildings that are both energy-efficient and human-centric.

## Programme Curriculum

**Thermal Comfort Optimization Training Course**

**Introduction**

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energy buildings, and climate-responsive architecture.

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**Course Duration**

5 days

**Course Objectives**

1. Understand thermal comfort indices (PMV, PPD, SET models)
2. Apply ASHRAE 55 and ISO 7730 standards in real projects
3. Optimize HVAC system performance for energy efficiency
4. Analyze indoor environmental quality (IEQ) parameters
5. Use computational fluid dynamics (CFD) simulations for airflow modeling
6. Implement adaptive thermal comfort models in buildings
7. Design climate-responsive and passive cooling strategies
8. Integrate smart sensors and IoT for real-time comfort monitoring
9. Improve building energy performance using simulation tools
10. Evaluate human-centric design principles in architecture
11. Apply machine learning for predictive thermal comfort control
12. Reduce carbon footprint through HVAC optimization techniques
13. Develop net-zero energy building comfort strategies

**Target Audience**

1. HVAC Engineers
2. Mechanical Engineers
3. Building Energy Consultants
4. Architects & Urban Planners
5. Sustainability Managers
6. Facility Managers
7. Construction Project Engineers
8. Smart Building Technology Specialists

**Course Modules**

**Module 1: Fundamentals of Thermal Comfort Science**

- Introduction to thermal comfort principles
- Heat balance and human physiology
- Environmental comfort parameters
- Comfort perception variability
- Standards overview
- **Case Study:** Office building discomfort analysis in a tropical climate

**Module 2: Psychrometrics and Indoor Climate Analysis**

- Psychrometric chart interpretation
- Air temperature and humidity interaction
- Dew point and enthalpy concepts
- Moisture control strategies
- Indoor climate diagnostics
- **Case Study:** Hospital humidity control optimization

**Module 3: HVAC System Design for Comfort Optimization**

- HVAC system types and selection
- Load calculation and zoning strategies
- Air distribution efficiency
- Energy-efficient HVAC controls
- System performance tuning
- **Case Study:** Commercial mall HVAC retrofit for energy savings

**Module 4: Computational Fluid Dynamics (CFD) for Airflow Simulation**

- CFD modeling fundamentals
- Airflow pattern analysis
- Temperature distribution mapping
- Ventilation effectiveness evaluation
- Simulation validation techniques
- **Case Study:** Airport terminal airflow optimization

**Module 5: Adaptive Thermal Comfort Models**

- Adaptive comfort theory
- Occupant behavior analysis
- Seasonal comfort adaptation
- Natural ventilation strategies
- Mixed-mode building design
- **Case Study:** University campus adaptive cooling system

**Module 6: Smart Buildings & IoT-Based Comfort Monitoring**

- Sensor-based environmental monitoring
- Real-time data analytics
- Smart thermostats and automation
- Occupancy-based control systems
- Cloud-based building management systems
- **Case Study:** Smart office building in a tech park

**Module 7: Energy Efficiency & Sustainability Integration**

- Energy benchmarking techniques
- Carbon reduction strategies
- Renewable energy integration
- Green building certification
- Lifecycle energy assessment
- **Case Study:** Net-zero energy residential complex

**Module 8: Advanced Optimization & AI in Thermal Comfort**

- Machine learning for HVAC optimization
- Predictive comfort modeling
- Digital twins in building systems
- Optimization algorithms for energy savings
- Future trends in smart climate control
- **Case Study:** AI-driven smart skyscraper optimization

## Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

**Register as a group from 3 participants for a Discount**

**Send us an email: info@fineskilltrainingcenter.org or call** *+254769199797*

***Certification***

*Upon successful completion of this training, participants will be issued with a globally- recognized certificate.*

***Tailor-Made Course***

*We also offer tailor-made courses based on your needs.*

**Key Notes**

**a.** The participant must be conversant with English.

**b.** Upon completion of training the participant will be issued with an Authorized Training Certificate

**c.** Course duration is flexible and the contents can be modified to fit any number of days.

**d.** The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

**e.** One-year post-training support Consultation and Coaching provided after the course.

**f.** Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

# Upcoming Scheduled Sessions

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 27 Nov 2026 | Online | $1,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $1,500 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $4,500 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |

Ready to enroll or request a customized program? Book online or contact us:

**Register Online Now**

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com