



4-DAY COURSE SYLLABUS

Mechanical Systems in Buildings

MSBE01-ONL26 · ONLINE (ZOOM)

Sustainable design requires engineers, architects, owners, and facility managers to work as a team to provide high-quality, productive environments for people while considering the impact of their design on the environment. The LEED™ (Leadership in Energy & Environmental Design) rating system is an excellent way to quantify the sustainability of buildings.

This course focuses on sustainable design and operation of four major systems used in buildings: plumbing, fire protection, illumination, and noise and vibration control. Topics are introduced to individuals who have little background on the subject while also providing a valuable resource for experienced personnel working with mechanical and electrical systems in buildings.

CEUS / PDHS	INSTRUCTOR	DAYS	PRICE	WORKSHOPS	SKILL LEVEL	COURSE CODE
2.2 / 22	Dr. Mohamed Hamed, PhD, P.Eng., FEC	4	\$2,095.00 CAD	3 workshops	Beginner	MSBE01- ONL26

DESCRIPTION

Sustainable design requires engineers, architects, owners, and facility managers to work as a team to provide high-quality, productive environments for people while considering the impact of their design on the environment. The LEED™ (Leadership in Energy & Environmental Design) rating system is an excellent way to quantify the sustainability of buildings.

This course focuses on the design and operation of four major mechanical systems used in buildings: plumbing, fire protection, illumination, and noise and vibration control. It covers the science behind each system, descriptions of the many system and equipment options available, guidelines for selecting the most appropriate option, and workshops to reinforce the material.

Topics are introduced to individuals who have little background on the subject while providing a valuable information resource to experienced personnel working with mechanical and electrical systems in buildings.

WHAT YOU WILL LEARN

- Understand the fundamentals, design and operation of major mechanical systems in buildings
- Apply systematic procedures for the selection of systems and equipment for given applications
- Design and size plumbing, fire protection, and lighting systems
- Apply acoustical design principles and vibration isolation techniques in buildings
- Recognize sustainable design considerations for major mechanical systems

COURSE OUTLINE

- 01 Plumbing Equipment and Systems
- 02 Water Supply and Treatment
- 03 Domestic Water Distribution Systems and Plumbing Fixtures
- 04 Fire Protection Equipment and Systems
- 05 Fire Detection, Alarm, and Suppression Systems
- 06 Automatic Sprinkler Systems and Smoke Controls
- 07 Light and Lighting — Physics, Equipment, and Systems
- 08 Lighting Design, Calculations, and Daylighting
- 09 Noise and Vibration in Mechanical and Electrical Systems
- 10 Acoustical Design in HVAC Systems
- 11 Vibration Isolation and Seismic Vibration Control

WHO SHOULD ATTEND

- Architects
- Design and project engineers
- Facility managers
- Consultants
- Mechanical engineers and technologists
- Maintenance and operation personnel
- Other technical personnel needing to develop/upgrade/refresh their knowledge of mechanical and electrical systems in buildings

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Customize this course — We can offer a customized version of this course, in terms of duration and content, upon request.

[REQUEST CUSTOMIZATION](#)

DAILY SCHEDULE

4-Day Course Schedule

START 10:00 AM EST	END 5:00 PM EST	FORMAT Live Online	One-hour lunch break each day, plus refreshment and networking breaks each morning and afternoon session.
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DAY	TOPIC	SUBTOPICS
DAY I	Plumbing Equipment and Systems	· Water supply and treatment · Domestic water distribution systems · Plumbing fixtures and components · Planning plumbing facilities
	Workshop I	Sizing a plumbing system under the instructor's guidance
	Fire Protection Equipment and Systems	· Classification of fire and construction hazards · Planning for fire protection · Fire safety design · Fire detection and signaling devices · Fire alarm systems
DAY II	Fire Suppression and Smoke Control	· Fire suppression systems · Automatic sprinkler systems · Smoke controls
	Workshop II	Sizing and selection of a fire protection system under the instructor's guidance
	Light and Lighting	· Physics of light and the energy spectrum · Color and light controls · Electrical light sources · Factors in selecting light sources and equipment · General comparison of lighting systems
DAY III	Lighting Design	· Calculations of illumination — quantity and quality · Luminance categories and recommended levels · Design considerations and documentation · Daylighting and exterior lighting design · Design practice and alternative solutions
	Workshop III	Sizing and selection of a lighting system under the instructor's guidance
	Noise and Vibration in Mechanical Systems	· Basic concepts of sound · Useful design criteria · Acoustical design in HVAC systems · Mechanical equipment rooms and rooftop units · Noise in air supply systems and duct silencers · Room sound correction
	Sound Transmission and Vibration Control	· Transmission of sound through walls and ceilings · Isolation of mechanical vibration · Vibration isolators · Seismic vibration control and the Richter Scale · Guidelines for seismic design