INTRODUCTION TO HVAC DESIGN

AIA LEARNING OBJECTIVES:

At the conclusion of this course, the student will:

1. Be able to recognize the various HVAC systems, type of equipment, options and distribution.
2. Be able to perform cooling and heating load calculations for commercial buildings.
3. Be able to learn the practical applications and use of psychrometrics in HVAC design.
4. Be able to design air and water distribution systems (ductwork and piping) for HVAC design.
5. Be able to conceptualize, judge and select the most efficient HVAC systems for commercial buildings.
6. Be able to identify the requirements of the energy code and ASHRAE standards 90.1 and 62.1 in the design of HVAC systems.

AIA BROCHURE

Learn the engineering fundamentals and practical considerations for the design of components and layout of HVAC systems. Learn how to calculate cooling and heating loads for commercial buildings and apply the principles of psychrometric processes to the design of optimal air-conditioning and heating systems. Learn and identify the different types of HVAC systems and equipment commonly used in commercial buildings. This practical course outlines the design process for all major HVAC components including equipment selection and air and water distribution (ductwork and piping) and its major components (fans and pumps). You also study best practices in HVAC system design strategies for high efficiency building design from real-world case studies. Review the implications of the energy code and ASHRAE standard 90.1 and 62.1 in the design of HVAC systems. Ideal for engineers, architects, contractors, real estate developers and plant managers. Ideal if you plan, design, install or interact with HVAC systems for commercial buildings. This curriculum provides understanding of engineering fundamentals and systems operation, as well as knowledge of emerging technologies in HVAC.

Course Outline includes:

I. Introduction to heat transfer, refrigeration cycle and building envelope concepts.
II. Overview of commercial HVAC systems and equipment.
III. Cooling and heating load calculations.
IV. Psychrometric chart & processes.
V. Air distribution design.
VI. Water distribution design.
VII. HVAC equipment selection.
VIII. Efficiency HVAC design for high performance buildings.
IX. Review of energy code requirements in HVAC design.
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Topics include:


T 6-9 PM, 10 sessions
Juan C. Toro, PE
30 AIA/CES LUs, 30 PDH’s

FACULTY SHORT BIO

Juan C. Toro, PE, HBDP, CPMP, LEED AP is a Partner of GEA Consulting Engineers and oversees the technical engineering operation within the firm. He is an experienced mechanical engineer and has been responsible for designing complex and innovative mechanical systems for several LEED-certified buildings.

Juan is a Licensed Professional Engineer in the States of New York, New Jersey, Connecticut and North Carolina. He was one of the first engineers in the country to receive the certifications for High-Performance Building Design Professional (HBDP) and Commissioning Process Management Professional (CPMP) from the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE). He also holds certifications for Commercial Energy Plans Examiner and Commercial Energy Inspector from the International Code Council (ICC). Since 2005, he has been a LEED Accredited Professional through the United States Green Building Council (USGBC).
Additionally, he is a member of the Commercial Advisory Committee with the New York City Department of Buildings (NYCDOB) for the development of the latest version of the New York City Energy Conservation Code (NYCECC). He is also currently serving in the Energy Code Technical Committee of the American Council of Engineering Companies of New York (ACEC New York) and the Technical Advisory Group assisting in the development of a code review manual for NYSERDA covering the New York State Energy Code.

Juan is also an Adjunct Professor at New York University and Pratt Institute in their School of Continuing and Professional Studies. He develops and teaches full semester courses and one day seminars to engineers and architects on HVAC design and the latest version of the Energy Conservation Codes.

He is a member of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), the American Society of Mechanical Engineers (ASME), the Association of Energy Engineers (AEE) and the Urban Green Council.

Juan has been recognized on the “Top 20 Under 40” list by Engineering News-Record (ENR) New York, and the “Top 40 Under 40” list by Consulting-Specifying Engineer, which recognizes outstanding contributions of AEC professionals under the age of 40 to the construction industry.

**Certifications/Licenses**

- ASHRAE - certified High-Performance Building Design Professional (HBDP).
- ICC - certified Commercial Energy Plans Examiner
- ICC - certified Commercial Energy Inspector