

What is HVAC Systems Design and Control?

The "HVAC Systems Design and Control" classes at UCSD focus on practical aspects of the art and science of Heating, Ventilating and Air-Conditioning (HVAC). The courses evaluate practical solutions for energy efficient and sustainable HVAC designs. The program is designed to provide an outstanding means of professional advancement for those who are directly or indirectly involved with HVAC systems, facility engineering and building automation challenges. Each course starts with the basic fundamentals followed by practical application, real life examples and the most common design solutions. The curriculum focuses on the latest technology in HVAC practices and the most advanced energy conservation techniques. It also emphasizes critical do's and don'ts and accepted rules-of-thumb checks in the field of HVAC and building automation.

Who Should Attend?

This program is recommended for the professional advancement of HVAC designers and engineers, recent graduate engineers, facility engineers or for anyone involved with HVAC systems. It is also highly recommended for those taking the Mechanical Professional Engineering exam.

Instructor

Frank Shadpour, P.E., LEED AP, President of SC Engineers, Inc., ASHRAE Fellow, Program Chair of ASHRAE TC1.4, and the author of the book [The Fundamentals of HVAC Direct Digital Controls](#).

Textbook Required

[The Fundamentals of HVAC Direct Digital Control 3rd Edition](#)
by Frank Shadpour, P.E., LEED AP

To Register

Call 858.534.3400 or visit
www.extension.ucsd.edu/registration

For More Information

Visit: www.hvacddc.com

A SPECIALIZED CERTIFICATE PROGRAM IN HVAC SYSTEMS DESIGN AND CONTROL

Classes can be taken individually in any sequence. Completion of all five classes is required to receive this specialized certificate.

HVAC DDC Basics (Online)

Credit: 2 units

Covering the basics of HVAC and Direct Digital Controls (DDC), this course enables students to understand the simple basic fundamentals of HVAC DDC Systems Design. Topics include: the Six Steps of HVAC DDC System Design, DDC Controllers, Control Systems and Activities, the Foundation for Learning Practical Designs, Advanced HVAC DDC Control, and Sustainable Designs.

HVAC Systems Design

Credit: 3 units

This practical course is divided into single topics. Each lecture is followed by problem-solving and practical applications sessions. Topics include: HVAC systems, Air Distribution Systems, Fan Curves and Fan Selection, Piping Design, Pump Curves and Pump Selection, Coil Selection and Characteristics, HVAC Zoning, Indoor Air Quality, Chiller and Boiler Selection. This course also reviews the advantages and disadvantages of the latest energy efficient HVAC systems including Variable Air Volume, Chilled Beam, Positive Displacement, Ventilation, Variable Refrigerant Flow, Natural Ventilation, and Hybrid Natural Ventilation. An optional field trip is included with this course.

HVAC DDC System Design

Credit: 3 units

Explore HVAC and DDC system design and application. This fast paced course enables you to design the building automation system for a wide variety of energy efficient and sustainable buildings. This course reviews: Air Handling, Chilled Water, and Hot Water Systems Control for Constant Volume and Variable Air Volume (VAV) applications. Commissioning of HVAC DDC systems and various DDC open systems and protocols will be discussed. Instruction emphasizes critical do's and don'ts as well as the accepted rule-of-thumb checks in HVAC control design. An optional field trip is included with this course.

HVAC Design Calculations

Credit: 3 units

Learn the fundamentals and required calculations for the HVAC design of buildings. Topics include: Cooling and Heating Load Calculations for Commercial Buildings, Psychometric Chart Analysis, HVAC Energy and Return on Investment Analysis. Focus is on practical methods of HVAC calculations using governing codes and American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) guidelines. Emphasis is placed on accepted rule-of-thumb checks in HVAC load calculations and energy analysis, including a review of available computer programs. An optional field trip is included with this course.

HVAC DDC Networking

Credit: 1 unit

This course focuses on practical scenarios of communication and networking between DDC controllers and DDC systems. The topics include: HVAC DDC System Architecture, HVAC DDC Topologies and Protocols, ASHRAE BACnet, Gateways, Open Systems and LonWorks Platform, Practical Examples and Review of Real Projects. This course also addresses common questions such as: how to upgrade existing HVAC DDC systems, the advantages and disadvantages of open systems, and how to integrate various building automation systems. An optional field trip is included with this course.

Classes are offered on a rotating basis throughout the year. For a schedule, please visit: <http://www.hvacddc.com/classes/>



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YEAR	QUARTER	CLASS	BEGIN DATE
2015	Fall	HVAC Design Calculations	October
2016	Winter	HVAC DDC Basics (Online)	January
	Spring	HVAC DDC System Design	April
	Summer	HVAC DDC Basics (Online)	July
	Fall	HVAC DDC Networking	October
2017	Winter	HVAC DDC Basics (Online)	January
	Spring	HVAC Systems Design	April
	Summer	HVAC DDC Basics (Online)	July
	Fall	HVAC Design Calculations	October
2018	Winter	HVAC DDC Basics (Online)	January
	Spring	HVAC DDC System Design	April
	Summer	HVAC DDC Basics (Online)	July
	Fall	HVAC DDC Networking	October
2019	Winter	HVAC DDC Basics (Online)	January
	Spring	HVAC Systems Design	April
	Summer	HVAC DDC Basics (Online)	July
	Fall	HVAC Design Calculations	October
2020	Winter	HVAC DDC Basics (Online)	January
	Spring	HVAC DDC System Design	April
	Summer	HVAC DDC Basics (Online)	July
	Fall	HVAC DDC Networking	October
2021	Winter	HVAC DDC Basics (Online)	January
	Spring	HVAC Systems Design	April
	Summer	HVAC DDC Basics (Online)	July
	Fall	HVAC Design Calculations	October
2022	Winter	HVAC DDC Basics (Online)	January
	Spring	HVAC DDC System Design	April
	Summer	HVAC DDC Basics (Online)	July
	Fall	HVAC DDC Networking	October

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