**UC LA**

**CERTIFICATE PROGRAMS**

1. PLUMBING SYSTEMS DESIGN

[https://www.uclaextension.edu/r/ProgramDetails.aspx?reg=TT012#](https://www.uclaextension.edu/r/ProgramDetails.aspx?reg=TT012)

This sequence of courses serves as an introduction to plumbing systems design for commercial and industrial structures.

**COURSES:**

**Plumbing Systems I: Code and Engineering Fundamentals (Online)**

**ENGNR**X 400.8

This course reviews codes and basic engineering principles and graphic presentations related to plumbing systems design, including load calculations, piping design, and equipment selection, based upon the latest issue of several plumbing codes. Plumbing fixtures and piping material selection are also discussed. Topics include a brief plumbing history, plumbing fixtures, sanitary waste and vent, traps, pumps and sewage ejectors, potable hot and cold water, and storm water.

# Plumbing Systems II: Advanced Engineering Systems

**ENGNR**X 400.9

Students are provided with a comprehensive coverage of the design, calculation, and code requirements of advanced plumbing systems, including storm water systems, pumps and pumping systems, automatic fire sprinkler and standpipe systems, gaseous agent suppression systems, medical gas systems, specialized water treatment systems (such as water softening and deionizing), and fuel oil systems.

# Plumbing Systems III: Systems Applications

**ENGNR**X 400.10

The course covers the contract document preparation process consisting of plans and specifications, as well as the construction administration process of shop drawings and review of construction work in progress.

1. SEQUENTIAL PROGRAM IN HVAC DESIGN

<https://www.uclaextension.edu/r/ProgramDetails.aspx?reg=TT003>

This sequential program provides a foundation in the fundamentals of heating, ventilating, and air conditioning system design.

**COURSES:**

# HVAC Fundamentals

# **ENGNR** X 424.7

This is a preliminary course in air conditioning design with an emphasis on heat transfer and psychrometrics. The course covers the air conditioning design process and human thermal-comfort requirements. Principles of heat transfer are used to calculate heating and cooling loads of building structures. Actual design problems are discussed and reviewed.

# HVAC Systems

**ENGNR**X 424.8

This course briefly reviews the Carnot cycle as a refresher for studying the performance of various HVAC systems, including air-cooled, water-cooled, and supermarket systems cooled by a multi-circuited evaporative condenser. Students are introduced to different types of system specifications typically given to contractors. Instruction shows how large HVAC water-cooled, field-assembled systems are designed by selecting a factory-packaged water-cooled chiller and water tower.

# HVAC Controls

**ENGNR**X 424.9

Fundamentals of HVAC controls and their application to the many elements of heating, ventilating, and air conditioning systems used in commercial buildings. Instruction in control basics, theory, and types of controls provides a background to discussions of pneumatic, electric, electronic, and digital controls.

# HVAC Equipment

**ENGNR**X 424.10

This course provides comprehensive coverage of HVAC equipment selection. Air conditioning topics include air handling equipment, refrigeration equipment, condensers, chillers, cooling towers, and absorption.

1. Certificate in Global Sustainability

This 36-unit program has been designed for those interested in exploring the dynamic field of environmental sustainability, those needing to stay up to date in their current position or for individuals who want knowledge and skills to be better global citizens. Encompassing the fields of architecture, design, business, education, landscape architecture, law, marketing, public policy, real estate, science, technology and urban planning, this program will focus on major elements that impact the environment on a daily basis such as our use of water, air, land, energy and transportation.

**Courses treated as Full Time/Part Time in the field of Engineering.**

**Mechanical Engineering:**

[**http://www.registrar.ucla.edu/catalog/catalog11-12-519.htm#451842744\_pgfId-1012168**](http://www.registrar.ucla.edu/catalog/catalog11-12-519.htm#451842744_pgfId-1012168)

133AL. Power Conversion Thermodynamics Laboratory.

136. Energy and Environment.

171A. Introduction to Feedback and Control Systems: Dynamic Systems Control I.

171B. Digital Control of Physical Systems

172. Control System Design Laboratory

CM180. Introduction to Micromachining and Microelectromechanical Systems (MEMS).

CM180L. Introduction to Micromachining and Microelectromechanical Systems (MEMS) Laboratory.

273A. Robust Control System Analysis and Design.

277. Advanced Digital Control for Mechatronic Systems

CM280A. Introduction to Micromachining and Microelectromechanical Systems (MEMS).

284. Sensors, Actuators, and Signal Processing

**Electrical Engineering:**

[**http://www.registrar.ucla.edu/catalog/catalog11-12-307.htm**](http://www.registrar.ucla.edu/catalog/catalog11-12-307.htm)

M117. Computer Networks: Physical Layer

132A. Introduction to Communication Systems.

132B. Data Communications and Telecommunication Networks.

141. Principles of Feedback Control.

150DL. Photonic Sensor Design Laboratory

162A. Wireless Communication Links and Antennas

163B. Microwave and Millimeter Wave Active Devices

164L. Microwave Wireless Laboratory

M171L. Data Communication Systems Laboratory

180D. Systems Design

215C. Analysis and Design of RF Circuits and Systems

218. Network Economics and Game Theory

230A. Estimation and Detection in Communication and Radar Engineering.

230D. Signal Processing in Communications

232B. Telecommunication Switching and Queueing Systems

232C. Telecommunication Architecture and Networks

232D. Telecommunication Networks and Multiple-Access Communications

233. Wireless Communications Systems

240B. Linear Optimal Control

**Computer Science:**

[**http://www.registrar.ucla.edu/catalog/catalog11-12-249.htm**](http://www.registrar.ucla.edu/catalog/catalog11-12-249.htm)

118. Computer Network Fundamentals

130. Software Engineering.

136. Introduction to Computer Security

143. Database Systems

144. Web Applications

183. Introduction to Cryptography.

211. Network Protocol and Systems Software Design for Wireless and Mobile Internet

214. Data Transmission in Computer Communications

215. Computer Communications and Networks.

216. Distributed Multiaccess Control in Networks.

217A. Internet Architecture and Protocols

218. Advanced Computer Networks

233B. Verification of Concurrent Programs.

234. Computer-Aided Verification.

236. Computer Security.

240A. Databases and Knowledge Bases

240B. Advanced Data and Knowledge Bases.

241A. Object-Oriented and Semantic Database Systems.

244A. Distributed Database Systems

245A. Intelligent Information Systems.

246. Web Information Management.

249. Current Topics in Data Structures

276C. Speech and Language Communication in Artificial Intelligence

M282A. Cryptography

M282B. Cryptographic Protocols

**Others:**

[**http://www.registrar.ucla.edu/catalog/catalog11-12-327.htm#444365064\_pgfId-999566**](http://www.registrar.ucla.edu/catalog/catalog11-12-327.htm#444365064_pgfId-999566)

400A. Environmental Science and Engineering Problems Course.

400B. Environmental Science and Engineering Problems Course

400C. Environmental Science and Engineering Problems Course.

400D. Environmental Science and Engineering Problems Course.

<http://www.registrar.ucla.edu/catalog/catalog11-12-492.htm#446559064_pgfId-1009738>

284C. Managing Entrepreneurial Organizations

410. Operations Technology Management