

Certified HVAC - Refrigeration Training Program



This highly specialized and concentrated Program is ideally suited to following individuals who:

- A people who would like to become a professional of HVAC and Refrigeration systems.
- The people who are engaged in this profession, but not have the accredited certification can join.
- The professionals, who have sound experience and exposure, but cannot excel due to good certification, may join.

Program is offered by: 3D Educators – Trainers & Consultants

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Program Details

Inauguration

The Training Program will be inaugurated by a senior member of 3DEducators

Program Structure

Number of classes in a week	5 Classes
Duration of each class	4-Hour with Break
Total Duration	3 - Months

Other Learning Activities

Classroom Assignments	4
Presentations by Trainees	1

Program Topics and Time Allocation

The participants will cover the following syllabus:

Program Topics and Time Allocation

The participants will cover the following syllabus:

Certified HVAC & Refrigeration

The comprehensive training program related to HVAC & Refrigeration and its special work. The participant will cover the following detailed course content on Course Content Page.

About the Program Designer & Instructor

CONSORTIUM OF EXPERTS

The program is developed according to the requirements and need of the market. There are so many jobs that are available, which does not need so much theory, it will require Skills.

The program creates the opportunity to individuals and organizations, which can get the benefits from this state of art program and become more productive.

We “3D EDUCATORS” Team are thankful and highly appreciated to the team of experts who provided this wonderful accredited and recognized program for all for any sort of organization.

Program Syllabus

COURSE CONTENT:

Curriculum for HVAC Technician

Course Modules

- Module 1: HVAC Fundamentals
- Module 2: HVAC Electrical 1
- Module 3: HVAC Electrical 2
- Module 4: HVAC Systems 1
- Module 5: HVAC Refrigeration 1
- Module 6: HVAC Heating 1
- Module 7: HVAC Heating 2
- Module 8: HVAC Heat Pumps and HVACR Accessories

MODULE 1: HVAC FUNDAMENTALS

A. Fundamentals

- ☐ Introduction to the Industry
- ☐ HVACR Measurements
- ☐ Heat Energy
- ☐ Pressure
- ☐ Gas Works
- ☐ Air Works

B. Safety

- ☐ Hazard Communication Labels, Materials Safety Data Sheets, and Safety
- ☐ Training
- ☐ Personal Protective Equipment (PPE)
- ☐ Personal Safety in Confined Space and on Ladders
- ☐ Electrical Lockout/Tagout
- ☐ Fire Extinguishers and Compressed Gas Safety

- ☐ Back Protection, Scaffolds, Lifts, and Fall Protection

MODULE 2: HVAC ELECTRICAL 1

A. Electrical, Part I

- ☐ Introduction to the Industry
- ☐ What is Energy?
- ☐ Atomic Theory
- ☐ Basic Circuits
- ☐ Parallel Circuits
- ☐ Power

B. Electrical, Part II

- ☐ Magnetism
- ☐ Alternating Current
- ☐ Loads, Resistive, and Inductive
- ☐ Capacitors
- ☐ Impedance and Power Distribution

MODULE 3: HVAC ELECTRICAL 2

A. Electrical, Part III

- ☐ Control Methods, Temperature, and Pressure
- ☐ Residential Heat/Cool Thermostats at Low Voltage
- ☐ Really Good Relay Stuff
- ☐ Contractors Go, Starters Go with Protection
- ☐ Power Wiring
- ☐ Odds and Ends around a Schematic

B. Electrical, Part IV

- ☐ Basic Electric Motor Theory
- ☐ Open and Hermetic Motors
- ☐ Capacitor Motors
- ☐ Three-phase Motors
- ☐ The Application of Electric Motors
- ☐ Diagnosing and Replacing Electric Motors

MODULE 4: HVAC SYSTEMS 1

A. Systems Properties and Measurement

- ☐ Heat Energy and Comfort
- ☐ Properties of Air
- ☐ Psychrometrics

- ☐ Total Heat in Air
- ☐ Measuring a Heavy Invisible Moving Volume
- ☐ Air Flow Measurement

B. Systems II

- ☐ Heat Loads Introduction
- ☐ Conduction Loads
- ☐ Solar Gain
- ☐ Infiltration and Ventilation Loads
- ☐ Duct Load

MODULE 5: HVAC REFRIGERATION 1

A. Refrigeration I

- ☐ Basic Refrigeration Cycle Physics
- ☐ Compression and Compressors
- ☐ Condensation and Condensers
- ☐ Expansion and Metering Devices
- ☐ Evaporation and Evaporators
- ☐ Measure the Normal Cycle

B. Refrigeration II

- ☐ Refrigerants
- ☐ Compressor Accessories and Applications
- ☐ Low side Accessories and Applications
- ☐ High side Accessories and Applications
- ☐ Piping System Sizing and Applications
- ☐ Capacity Control Methods

MODULE 6: HVAC HEATING 1

A. Oil Heat

- ☐ Characteristics of Fuel Oil and Principles of Combustion
- ☐ Types and Construction of Oil Burners
- ☐ Oil Burner Anatomy, Part One
- ☐ Oil Burner Anatomy, Part Two
- ☐ Fuel Oil Tanks and Piping
- ☐ Complete Heating System

B. Gas Heat

- ☐ Fuel Gas Composition
- ☐ Pressure Regulators, Burners, and Heat Exchangers

- ☐ Standing Pilot Systems
- ☐ Electronic Ignition
- ☐ High efficiency Furnaces
- ☐ Troubleshooting Gas Burner Systems

MODULE 7: HVAC HEATING 2

A. HVACR Boilers

- ☐ Boiler Fundamentals
- ☐ Classifying Boilers
- ☐ Combustion
- ☐ The Heat Exchanger
- ☐ Controlling Energy Sources
- ☐ Boiler Accidents and Hazards

B. Hydronics

- ☐ System Concept
- ☐ Materials and Tools
- ☐ Boilers
- ☐ Pumps
- ☐ Heat Transfer Units
- ☐ System Accessories

MODULE 8: HVAC HEAT PUMPS AND HVACR ACCESSORIES

A. Heat Pumps

- ☐ What is a Heat Pump?
- ☐ Heat Pump Installation and Quality Criteria
- ☐ The Heat Pump Cooling Mode
- ☐ The Heat Pump Heating Mode
- ☐ The Heat Pump Defrost Mode
- ☐ Heat Pump Components
- ☐ Heat Pump Troubleshooting

B. HVACR Controls

- ☐ Building and HVAC Systems
- ☐ Air Circulation and Air Quality
- ☐ Control System Characteristics
- ☐ Process Characteristics and Control Systems
- ☐ Control System Components

**FINAL CERTIFICATION SHALL BE AWARDED BY IMRTC (INTERNATIONAL
MANAGEMENT RESEARCH & TECHNOLOGY CONSORTIUM) – USA**



Students who are unable to appear for the final exam are required to submit a written application stating the reason for not appearing for the exam. 3D Educators reserves the right to approve or deny such applications. If approved, the student will be allowed to sit for the exam within one month. Failure to do so, the student will be resubmit the examination fee and sit the future schedule exam. Without passing of the exams no certification will be awarded.



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ONLINE LIVE CLASSES FACILITY AVAILABLE

- Instructor Led Training
- Real Time Presentations
- Interactive Classes
- Complete Notes and Other Stuff shall be provided through our Secure Student Login Member's Area
- For Online Live Classes, you may please download the Admission Form through our website <http://www.3deducators.com>. Fill it properly and attached the required document along with Picture and send back to info@3deducators.com with scanned fee submitted voucher in the bank.
- For Pakistan you may submit the fee at any MCB Branch with the title of "3D EDUCATORS-TRAINERS & CONSULTANTS".
- If you are outside Pakistan then you may transfer via Bank to Bank or any western union, Fast Track, Money Gram or else International Transfer Body.
- After Admission, if you don't have GMAIL Account then you are requested to kindly make one GMAIL Account and shared it info@3deducators.com. Then further correspondence shall be made by our institute official.
- Extra Bandwidth Charges shall be incurred.
- If you are outside country or city then extra courier charges shall be incurred for Certificate.

PRECAUTIONARY MEASURES

- ✓ During Classes, you are requested to make sure that you are in isolated room, where no noise should be there except your voice.
- ✓ Kindly Switch Off your Cell Phone during the class, because it will disturb the quorum of class.
- ✓ If you have taken the admission in the course online, ethically it is recommended and suggested that you only avail this facility.
- ✓ Recording of Lectures are not allowed at your end.

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This world is emerging and growing in the 21st Century very rapidly because of latest and remarkable technologies and its advancement. Due to advancement of technology, we 3D EDUCATORS offer Live Interactive class sessions.

3D EDUCATORS believe on Information Technology and its systems. Now you can also avail this facility at your home.



DISTANCE NOT MATTER

You can join in the live classes Sessions of **3D EDUCATORS – TRAINERS & CONSULTANTS** from anywhere of the world.

CONTACT US:

9221-34141329

9221-34857148

0333-2402474

0322-2083032

info@3deducators.com

<http://www.3deducators.com>

(Get the Admission Form)

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MANAGEMENT

3D EDUCATORS – TRAINERS & CONSULTANTS



FINAL CERTIFICATION AWARDED BY IMRTC – USA

SAMPLE CERTIFICATE

**CERTIFICATE
OF EXCELLENCE**

IMRTC USA Recognized
CERTIFICATION



This is to Certify That
Mr. Danny Jones Wales
*has successfully met the certification requirements as outlined in
IMRTC content and the policies adopted thereunder; hereby grants the certification of*

Certified OHSAS 18001 Lead Implementation

Student ID: IM864532201

Date of Commencement: May 4, 2014

Date of Ending: July 4, 2014



Cheryzel Rhodes

Principal of Institute

Director Affiliations and Official Affairs

INTERNATIONAL MANAGEMENT RESEARCH & TECHNOLOGY CONSORTIUM
Address: 2 Amy Avenue, Edison NJ 08817 NEW JERSEY - United States of America

Chapter ID: AS2933770
Partnership ID: AS5588322_Pakistan
Verification@imrtc.org

CERTIFICATE OF AUTHORIZATION

**CERTIFICATE
OF AUTHORIZATION**

IMRTC USA Recognized

CERTIFICATE OF AUTHORIZATION



This is to Certify That IMRTC Authorized

3D EDUCATORS - TRAINERS & CONSULTANTS

*to work as Training & Research Partner in capacity of
PARTNER THROUGH PAKISTAN CHAPTER
for the scope of activity shown below in accordance with the applicable rules of
the IMRTC. The use of this certification and the authority granted by this
Certificate of Authorization are subject to the provision of agreement set
forth in the application.*

*The validity of this certificate is for Two Years from the date of Issuance
and will increase according to the performance
Issuance Date: 16 Aug 2015*

Cheryzel Rhodes

Director Affiliations and Official Affairs



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