HEATING, VENTILATION AND AIR CONDITIONING PLUS

The names of the .pdf (Adobe Acrobat) files containing subcourses/manuals on this CD can be found in the "Table of Contents" (which also contains the links to detailed descriptions). In order to open a specific manual please note the name of the corresponding file, click "Open File", select your CD-ROM drive (if it does not get selected automatically), and then double click that file.

The following will make browsing this CD and reading/printing manuals on it much simpler:

- **You can always exit the full screen mode by pressing the "ESC" button.**
- **Clicking the "Bookmark" or "Thumbnails" tab in each subcourse will allow fast transition between screens.**

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View Description	**TI 810-10**	▷ Mechanical Design: Heating, Ventilation and Air Conditioning (32 pp)
View Description	**TI 810-11**	▷ HVAC Control Systems I (449 pp)
View Description	**TM 5-815-3**	▷ HVAC Control Systems I (208 pp)
View Description	**TI 810-11 CADD Files**	▷ HVAC Control Systems CADD Files (Description)
View Description	**TI 810-11 CADD Files**	▷ HVAC Control Systems CADD Files (Index of Files) (17 files)
View Description	**15950A**	▷ HVAC Control Systems II (119 pp)
View Description	**MIL-HDBK-1003-3**	▷ Heating, Ventilating, Air Conditioning and Dehumidifying Systems (227 pp)
View Description	**TM 5-642**	▷ Operation and Maintenance Small Heating Systems (159 pp)
View Description	**TM 5-650**	▷ Central Boiler Plants (351 pp)

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Subcourses/manuals on this CD (screen 2 of 3):

View Description	**MIL-HDBK-1003-17**	▷	Industrial Ventilation Systems (138 pp)
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View Description	**NAVEDTRA 14050**	▷	CONSTRUCTION MECHANIC ADVANCED (414 pp)
View Description	**NAVEDTRA 14075**	▷	ENGINEMAN 1 & C (306 pp)
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View Description	**NAVEDTRA 14151**	▷	MACHINIST'S MATE 3 & 2 (SURFACE) (552 pp)
View Description	**EN0113**	▷	CONSTRUCTION PRINT READING (500 pp)
View Description	**NAVEDTRA 14040**	▷	BLUEPRINT READING AND SKETCHING (185 pp)

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Mechanical Design: Heating, Ventilation and Air Conditioning : TI 810-10

Description: This document provides guidelines for design of heating, ventilating, and air conditioning (HVAC) mechanical systems. This document delineates only those features of HVAC design that are unique in their applications, or reflect policies that have been established through regulations, directives, and other published media through the Department of Defense. Unless otherwise specified, all designs will comply with the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks and Military Handbook 1008C.

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HVAC Control Systems I : TI 810-11

Description: This document provides criteria and guidance for the design of heating, ventilating and air conditioning (HVAC) control systems, and designates the standard control loops to be used. These instructions describe frequently encountered control system loops, provide examples of how these loops are used, and provide guidance and criteria for the design of standard HVAC control systems and standard control panels. This document does not provide guidance on selecting HVAC systems and does not prohibit selection of system types not included herein.

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HVAC Control Systems I : TM 5-815-3

Description: This manual is very similar/identical to HVAC Control Systems I (TI 810-11) but in a different format better suitable for printing.

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HVAC Control Systems CADD Files (Description) : TI 810-11 CADD Files

Description: This directory contains “typical contract drawing" templates which can be used when creating design drawings for HVAC control systems. The templates are not intended to be incorporated into a contract package “as-is." They are “seed" or “starter" files and will require editing to make them “project specific." It is the designer’s responsibility to ensure that a complete and biddable set of contract drawings is produced. Development of contract drawings and specifications is to be done in accordance with the guidance contained in TI 810-11. Each file contains standard HVAC control system designs for systems based on the use of the Single-Loop Digital Controller (SLDC) control panel and also the use of Direct Digital Controls (DDC). File names correspond to the figure numbers used for the standard systems depicted in chapter 4 of TI 810-11.

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HVAC Control Systems CADD Files (Index of Files) : TI 810-11 CADD Files

Description: See the previous screen.

Contents: • 4-07.dgn - Standard control system (SCS) for central plant steam hydronic system. • 4-08.dgn - SCS for single building hydronic heating system with hot water boiler. • 4-09.dgn - SCS for central plant high-temperature hot water hydronic heating system. • 4-10.dgn - SCS for central plant steam dual-temperature hydronic system. • 4-11.dgn - SCS for central plant high-temperature hot water dual-temperature hydronic system. • 4-12.dgn - SCS for single building dual-temperature hydronic system. • 4-13.dgn - SCS for heating and ventilating system. • 4-14.dgn - SCS for multizone HVAC system. • 4-15.dgn - SCS for dual-duct HVAC system. • 4-16.dgn - SCS for bypass multizone HVAC system. • 4-17.dgn - SCS for VAV HVAC system without return fan. • 4-18.dgn - SCS for VAV HVAC system with return fan. • 4-19.dgn - SCS for single zone HVAC system. • 4-20.dgn - SCS for single zone HVAC system with dual-temperature coil. • 4-21.dgn - SCS for single zone HVAC system with humidity control. • 4-22.dgn - SCS for single zone HVAC system with DX coil. • Legend.dgn - Standard symbols

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HVAC Control Systems II : 15950A

Description: Section 15950A: Heating, Ventilation and Air Conditioning Control Systems

Contents: ● Part 1. General ● Part 2. Products ○ Material and Equipment ○ General Equipment Requirements ○ Materials ○ Actuators ○ Automatic Control Valves ○ Dampers ○ Duct Smoke Detectors ○ Instrumentation ○ Thermostats ○ Pressure Switches and Solenoid Valves ○ Indicating Devices ○ Single Loop Controllers ○ Control Devices and Accessories ○ Pilot Lights and Manual Switches ○ HVAC System Control Panels ○ Compressed Air Stations ○ Electronic Variable Air Volume (VAV) Terminal Unit Controls ● Part 3. Execution ○ General Installation Criteria ○ Control System Installation ○ Control Sequences of Operation ○ Commissioning Procedures ○ Balancing, Commissioning and Testing ○ Training

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Heating, Ventilating, Air Conditioning and Dehumidifying Systems : MIL-HDBK-1003-3

Description: This handbook is for the use of design and construction of Naval Facilities heating, ventilating, air conditioning, and dehumidifying systems.

Contents: • • Introduction • General • Applications • Information Required on Drawings • Load Calculations • Air Distribution • Piping Systems • Controls and Instrumentation • Equipment Location • Fundamental Drawing Details • Rules of Thumb Guidance • Fire Protection and Smoke Control • Appendices • Reference • Glossary

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Operation and Maintenance Small Heating Systems : TM 5-642

Description: This technical manual provides basic information for facilities personnel regarding the operation and maintenance of small heating systems and related equipment. Generally, the manual covers low pressure steam boilers (less than 15 psig), low pressure hot water boilers (less than 30 psig), space heaters, unit heaters, and warm air furnaces. The term “small" is used in the context of this manual to differentiate from the high pressure systems and equipment that are covered in detail in TM 5-650, Central Boiler Plants. This manual makes reference to specific types of equipment commonly in use at Army installations. System and equipment descriptions contained in the manual are general in nature. Equipment manufacturers* technical literature and manuals should also be used for reference, training, and troubleshooting specific equipment.

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Central Boiler Plants : TM 5-650

Description: The purpose of this manual is to provide information and guidance on the installation, operation and maintenance of U.S. Army Central Boiler Plant equipment. Efficient plant operation becomes more important with each increase in the cost of fuel and equipment. The Central Plant operator has an important job in achieving and maintaining maximum efficiency of plant operation. The information and guidance in this manual should be reviewed as a first step toward achieving efficient plant operation.

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Industrial Ventilation Systems : MIL-HDBK-1003-17

Description: This handbook provides the basic design guidance for industrial ventilation systems at military installations. It is intended for use by experienced architects and engineers. The first section addresses general criteria for use in all industrial ventilation systems. Other sections include ventilation design data for specific processes, including asbestos delagging, torpedo maintenance, metal cleaning and electroplating, fiberglass reinforced plastic repair and lay up, abrasive blasting, spray coating, foundry operations and woodworking.

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Cooling Buildings by Natural Ventilation : MIL-HDBK-1011-2

Description: This handbook provides guidance and criteria for the design of buildings to be totally or partially cooled by natural ventilation. It describes several natural criteria; design criteria for natural ventilation and for zoned or seasonal occupant and maintenance manuals, and guidelines for wind tunnel testing. Appendices include forms and overlays for the designer's use and describe the fundamental principles of comfort related to airflow, a methodology for climate analysis, prediction, and evaluation.

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SAFETY OF ELECTRICAL TRANSMISSION AND DISTRIBUTION SYSTEMS : MIL-HDBK-1025-10

Description: This handbook is directed to the safety concerns of operators, electricians, and supervisors who perform and supervise operation and maintenance work on electrical transmission and distribution systems.

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HVAC of Hardened Installations : TM 5-855-4

Description: This manual provides guidance for engineers in the planning and design of heating, ventilation, and air-conditioning (HVAC) for hardened military and strategic facilities at new or existing Army installations. The material presented includes data for auxiliary equipment systems with special reference to underground installations not normally covered in HVAC manuals. The term “hardened” applies to facilities intentionally designed to be resistant to conventional explosive effects, nuclear weapons effects, chemical or biological attack, and intruder attack. This manual addresses the technology of HVAC systems as it pertains to hardened facilities without regard to a specific type of attack, unless specifically required for design purposes.

Contents: • Introduction • Design Considerations • Underground Heat Transfer • HVAC Equipment • Waste Heat Disposal • Decontamination Facilities

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UTILITIES I : EN0158

Description: As an engineer officer you may be assigned the job of directing some phase of utilities work. To do this efficiently, you must understand the broad, general phases of utilities operations. That is the purpose of this subcourse. It is planned to give you basic knowledge in utilities layout, installation, and operation.

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UTILITIES II : EN0389

Description: The material in this subcourse broadly covers the principles involved, and the methods and equipment employed, in the design, construction, and operation of electric power and distribution systems, water supply distribution systems, and sewage collection and treatment systems. Large semipermanent installations in a theater of operations such as depots, base hospitals, replacement depots, and the like require fairly extensive, complex utilities systems. The design, construction, rehabilitation (where necessary) and operation of these systems are responsibilities of engineer units. While this course will not make you an expert, it will furnish sufficient basic information to enable you to function as an engineer staff officer or commander in the communications zone of a theater of operations.

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UTILITIESMAN BASIC, VOLUME 1 : NAVEDTRA 14265

Description: Utilitiesman Basic, Volume 1 consists of chapters on Plans, Specifications, and Color Coding; Advanced Base Functional Components (ABFC); Plumbing; Plumbing Valves and Accessories; Plumbing Fixtures and Plumbing Repairs; Prime Movers, Pumps, and Compressors; Water Treatment; and Equipment Maintenance.

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UTILITIESMAN BASIC, VOLUME 2 : NAVEDTRA 14279

Description: Utilitiesman Basic, Volume 2 consists of chapters on Boilers; Boiler Maintenance; Steam Distribution Systems; Heating Systems; Galley and Laundry Equipment; Refrigeration; and Air Conditioning.

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UTILITIESMAN ADVANCED : NAVEDTRA 14259

Description: In completing this nonresident training course, you will demonstrate a knowledge of the subject matter by correctly answering questions on the following: Blueprint Reading and Technical Drawings; Planning, Estimating and Scheduling; Planning Plumbing Projects; Fire Protection Systems; Water Treatment and Purification; Sewage Treatment and Disposal; Compressed Air Systems; Boilers; Duct and Ventilation Systems; Air Conditioning and Refrigeration; and Environmental Pollution Control.

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CONSTRUCTION MECHANIC BASIC, VOL 1 : NAVEDTRA 14264

Description: Construction Mechanic Basic, Volume 1 consists of chapters on Technical Adminstration; Principles of an Internal Combustion Engine; Construction of an Internal Combustion Engine; Gasoline Fuel Systems; Fuel Diesel Fuel Systems; and Cooling and Lubricating Systems.

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CONSTRUCTION MECHANIC BASIC, VOL 2 : NAVEDTRA 14273

Description: Construction Mechanic Basic, Volume 2 consists of chapters on Basic Automotive Electricity; Automotive Electrical Circuits and Wiring; Hydraulic and Pneumatic Systems; Automotive Clutches, Transmissions, and Transaxles; Drive Lines, Differentials, Drive Axles, and Power Train Accessories; Construction Equipment Power Trains; Brakes; and Automotive Chassis and Body.

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CONSTRUCTION MECHANIC ADVANCED : NAVEDTRA 14050

Description: Describes the duties and responsibilities of the construction mechanic in a battalion or Public Works assignment. Their tasks concern procedures for conducting vehicle safety inspections and Battalion Equipment Evaluation Programs; overhauling internal combustion engines; and troubleshooting vehicle electrical systems, fuel systems, and power trains (including automatic transmissions), hydraulic systems, air-conditioning systems, and wheel and track alignment systems.

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ENGINEMAN 1 & C : NAVEDTRA 14075

Description: Provides training on the following subject matter areas: Describes procedures for scheduling, administering, and supervising work; the purpose and nature of the Engineering Operational Sequencing System and Engineering Operational Casualty Control System; troubleshooting and corrective maintenance procedures for diesel engines, their accessories, reduction gears, main line shafts and shaft bearings; factors affecting engine performance and efficiency; construction, troubleshooting and maintenance of complex refrigeration and air conditioning systems, compressed air systems, auxiliary boilers, and hydraulic systems; procedures for engineering casualty control, maintaining engineering records and reports, conducting trials of engineering equipment and systems, and preparing for administrative and operational inspection.

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ENGINEMAN 2 : NAVEDTRA 14076

Description: Prepares enlisted personnel for advancement to petty officer second class in the Engineman rating. This course includes the following topics: administration and training; measuring and repair instruments; internal combustion engines; speed controlling devices; refrigeration and air-conditioning; compressed air systems; laundry, mess deck, galley, scullery, and other auxiliary equipment; and lathe and machining operations.

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ENGINEMAN 3 : NAVEDTRA 14331

Description: Provides an introduction to the Engineman rating and information on the reciprocating internal-combustion engine, principal stationary and moving parts of an engine, drive mechanisms, intake and exhaust systems, cooling systems, lubricating oil systems, diesel fuel systems, control devices, starting systems, diesel engine operating practices, transmission of engine power, pumps and valves, compressed air systems, distilling plants, refrigeration, air conditioning, and auxiliary equipment.

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MACHINIST'S MATE 1 & C (SURFACE) : NAVEDTRA 14150

Description: Provides information on the following subjects: management programs; propulsion turbines; reduction gears; steam-driven generators; heat exchangers and air ejectors; pumps, distilling plants; refrigeration and air conditioning; auxiliary equipment; propulsion plant efficiency; quality assurance; record systems; boiler firesides and watersides, boiler fittings and instruments; and environmental policies and procedures.

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MACHINIST'S MATE 3 & 2 (SURFACE) : NAVEDTRA 14151

Description: Provides information on the following topics in the MACHINIST'S MATE (Surface) rating: introduction to the MACHINIST'S MATE (Surface) rating; steam turbines; reduction gears and associated equipment; lubrication and associated equipment; pumps and forced draft blowers; heat exchangers and air ejectors; engineering operations and administration; steam operated distilling plants, valves, pipe fittings, and piping; refrigeration and air conditioning; compressed air systems; auxiliary equipment; propulsion boilers and boiler fittings and instruments; automatic air controls; and boiler water/feedwater test treatment.

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CONSTRUCTION PRINT READING : EN0113

Description: Construction print reading is a key skill for technical students. Fortunately, a formal education is not essential for achieving proficiency in this important subject; the study of correspondence courses such as this can provide the essential skills.

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BLUEPRINT READING AND SKETCHING : NAVEDTRA 14040

Description: Covers blueprint reading and drawing with examples from several fields of work where blueprints are normally used.

Contents: • 1. Blueprint Reading • 2. Technical Sketching • 3. Projections and Views • 4. Machine Drawings • 5. Piping Systems • 6. Electrical and Electronics Prints • 7. Architectural and Structural Steel Drawings • 8. Developments and Intersections • APPENDIX I. Glossary • APPENDIX II. Graphic Symbols for Aircraft Hydraulic and Pneumatic Systems • APPENDIX III. Graphic Symbols for Electrical and Electronics Diagrams • References

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