



Contren® Learning Series

2008 CATALOG

NATIONAL CENTER FOR CONSTRUCTION EDUCATION AND RESEARCH

Construction | Maintenance | Pipeline | Safety | Management



BUILDING TOMORROW'S WORKFORCE



- Developed by the Industry... for the Industry
- Portable, Industry-Recognized Credentials
- Standardized, Competency-Based Curricula

Table of Contents

ABOUT NCCER

Letter from the Chairman	2
New Products for 2008	3
The NCCER Program	4
NCCER Module Numbers	5
Program Structure and SME Information	6
Assessments	7
Contren® Connect ebooks	8

CONSTRUCTION & MAINTENANCE

Core Curriculum	9
- <i>Careers in Construction</i>	10
- <i>Applied Construction Math</i>	10
- <i>Safety Orientation</i>	11
- <i>Tools for Success</i>	11
Boilermaking	12
Carpentry	15
- <i>From the Ground Up</i>	16
Cabinetmaking	18
Concrete Finishing	19
Construction Craft Laborer	20
Construction Technology	21
Drywall	22
Electrical	23
- <i>The Household Circuit</i>	26
Electronic Systems Technician	29
Heavy Equipment Operations	32
Highway/Heavy Construction	34
Hydroblasting	34
HVAC	35
Industrial Coatings	39
Industrial Maintenance Electrical & Instrumentation	40
Industrial Maintenance Mechanic	42
Instrumentation	47
Insulating	50
Ironworking	52
Masonry	55
Millwright	57

Mobile Crane Operations	60
Painting	62
Pipefitting	65
Pipelayer	67
Plumbing	68
Reinforcing Ironwork	72
Rigging Fundamentals	73
Rigging	73
Scaffolding	74
Sheet Metal	75
Site Layout	78
Sprinkler Fitting	79
Welding	82

PIPELINE

Gas Pipeline Operations	85
Liquid Pipeline Field Operations	86
Liquid Pipeline Control Center Operations	87
Pipeline Corrosion Control	88
Pipeline Electrical & Instrumentation	89
Pipeline Maintenance	91
Pipeline Mechanical	93

SAFETY

Safety Orientation	96
Field Safety	96
Safety Technology	98

MANAGEMENT

Introductory Skills for the Crew Leader	100
Project Supervision	100
Project Management	100
Other Pearson Titles of Interest	102

ORDERING AND CUSTOMER SERVICE

Ordering and Customer Service	103
Pearson/NCCER Contren® Curricula Order Form	104



Letter from the Chairman



Steve Halverson
2008 Chairman, NCCER

These are exciting times for the construction industry. Our industry is globalizing, becoming more productive, applying technology in new ways and becoming much safer. Demand for skilled construction professionals is at an all-time high. Nationally, more than a quarter of a million new construction jobs need to be filled each year. NCCER's mission is simple - help people join this dynamic industry by providing proven, standardized and effective training.

Through its Contren® Learning Series, NCCER and Pearson continue to build products with one goal in mind—developing the skills of our current and future workforce. From new online learning tools, to an ever growing list of craft-training and assessment titles—including titles now available in Spanish—NCCER provides those teaching and learning the trade with the tools needed for success. See new highlighted products for 2008 on page 3 and a list of skill assessments available through NCCER on page 7.

As the 2008 chairman for the NCCER Board of Trustees, I look forward to helping our industry attract and develop the skilled workforce that is so vital to our industry's future.

Sincerely,
Steve Halverson
CEO
Haskell Co.

See what other people are saying about NCCER and Contren®!

"KBR utilizes the Contren® Learning Series because it provides our craft professionals with the highest quality of standardized training available and provides a documented career path of their training accomplishments."

Andy Johnson, director, Construction-Americas, KBR

"I use the Contren® Learning Series because it is easy to use, straightforward, and what the industry wants its craft professionals to know. The added benefit for using it in the high school is that it leads to nationally recognized credentials and gives the student a head start in their career."

Cal Pygott, instructor, Bothell High School

"The Contren® Learning Series is a standardized, competency-based industry developed curriculum that provides our youth all the tools necessary to build the foundation for a fulfilling career in construction."

Kristey Richardson, CTC coordinator, Construction Technology Careers of Manatee & Sarasota Counties

"NCCER materials are the vehicle that will drive our success. NCCER is about more than craft-specific knowledge; it's also about making sure that instruction is delivered in a structured sequence, by NCCER-certified instructors, so that skills are built upon. Equally important is the National Registry, "storehouse" for successful module completion and database for articulation."

John Easley, state trade and industry program manager, Louisiana Technical College

"Windham School District's most important goal is to prepare our students for a career. We don't just believe, we know, that by using the Contren® Learning Series curriculum our students are prepared to succeed in the construction industry with a career path second to none."

Gary Clark, training coordinator/career and technology education Windham School District, Texas Department of Criminal Justice

"Fluor believes in providing the construction industry with a skilled, quality workforce. NCCER's curriculum allows us to provide reliable, portable training worldwide."

Rick Graves, vice president of power services, Fluor Corporation



NEW for 2008

2008 will once again be an exceptional year for new and revised products! Examples include our industry leading HVAC curriculum, Industrial Maintenance, and our Electrical curriculum revision to the 2008 NEC! PLUS, our enhanced commitment to training materials in Spanish will be unprecedented. Check out the details below!



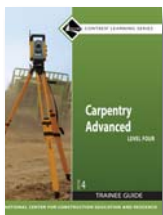
Cabinetmaking
p. 18



Industrial Coatings
Level 1 & 2
p. 39



Pipefitting Level 4
p. 66



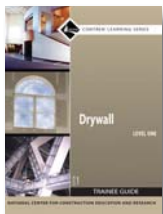
Carpentry
Level 4
p. 18



Industrial Maintenance
Electrical & Instrumentation
Technician Level 2 & 3
p. 41-42



Sheet Metal
Level 1
p. 75



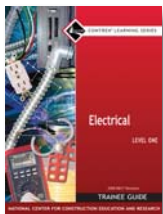
Drywall
Level 1 & 2
p. 22



Industrial Maintenance
Mechanic
Level 2 & 3
p. 43-44



Sprinkler Fitting
Level 3 & 4
p. 80-81



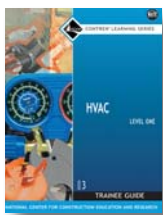
Electrical
Level 1 & 2
p. 24-26



Millwright
Level 3
p. 58



Project Management
Level 1
p. 100



HVAC
Level 2 & 3
p. 35-36

NEW SPANISH LANGUAGE PRODUCTS

More titles in Spanish than ever before!

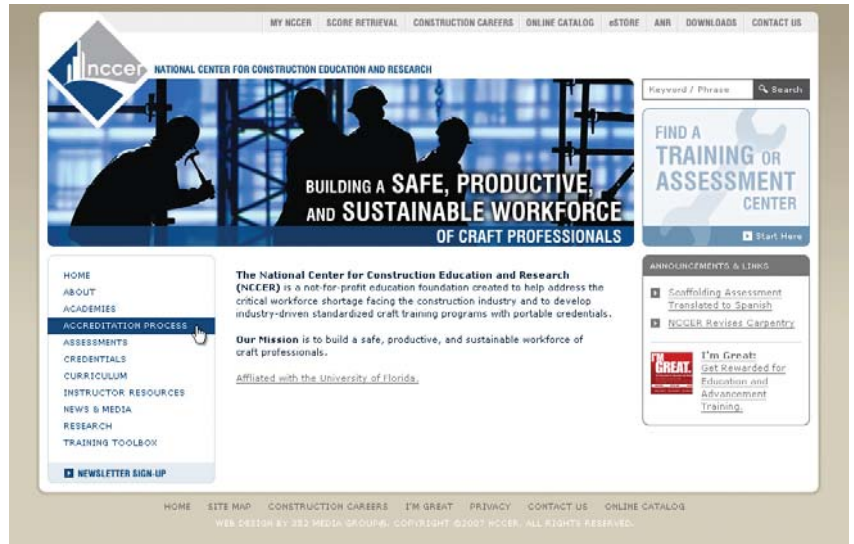
Carpentry Fundamentals Level 1 . . . p. 15	Reinforcing Ironwork Level 1 p. 72
Concrete Finishing Level 1 p. 19	Rigging Fundamentals p. 73
Drywall Level 1 p. 22	Scaffolding p. 74
Electrical level 1 p. 24	Sprinkler Fitting Level 1 p. 79
Insulating Level 1 p. 50	Field Safety p. 96
Pipefitting Level 1 p. 65	

Also look for NCCER's internet-based Construction English series coming in 2008!



The NCCER Program

The National Center for Construction Education and Research (NCCER) is a not-for-profit education foundation created to help address the critical workforce shortage facing the construction industry and to develop industry-driven standardized craft training programs with portable credentials. With the support of its publishing partner Pearson, NCCER leads the industry in building a safe, productive, and sustainable workforce of craft professionals.



www.nccer.org

INDUSTRY STANDARD

NCCER sets the standard in construction education. Founded more than a decade ago by leading contractors, associations and manufacturers, NCCER's training process of accreditation, instructor certification, standardized curriculum, national registry, assessment, and certification is a key component in the industry's workforce development efforts.

PROGRAM ACCREDITATION

As the accrediting body for the industry, NCCER establishes the benchmark for quality training and assessments. By partnering with industry and academia, NCCER has developed a system for program accreditation that is similar to those found in institutions of higher learning. This process fosters unity among the construction industry nationwide, while providing a defined career path with industry-recognized credentials.

- ▶▶ Visit the "Find a Training or Assessment Center" section at www.nccer.org for a listing of NCCER Accredited Training and Assessment Centers in your area.

INSTRUCTOR CERTIFICATION

As part of its accreditation process, NCCER has developed the Instructor Certification Training Program (ICTP). This program ensures the uniform and consistent delivery of training. Through this process, NCCER certifies the master trainer, who in turn, certifies the local craft instructor. Craft instructors are journeyman craft professionals or career and technical educators trained and certified to teach the Contren® Learning Series. This network of certified instructors assures that NCCER training programs will meet the standards of instruction set by the industry. There are more than 3,500 master trainers and 40,000 craft instructors within the NCCER instructor network.

- ▶▶ Visit the "Credentials" section at www.nccer.org for more information.

STANDARDIZED CURRICULUM

In cooperation with publishing partner, Pearson, NCCER develops and publishes the Contren® Learning Series, a world-class curriculum created by Subject Matter Experts representing contractors and schools from around the country. SMEs ensure exceptional training programs that meet or exceed national industry standards. The Contren® Learning Series, which includes more than 45 craft areas, is taught nationwide by contractors, associations, construction users, and secondary and post-secondary schools. In addition, multiple state Departments of Education recognize the curriculum. Unique features of the Contren® Learning Series include: competency-based and measurable objectives; modular format; compliance with the Office of Apprenticeship requirements for time-based training; and portable, industry-recognized credentials.

- ▶▶ Visit the "Online Catalog" section at www.nccer.org for the latest curriculum updates.

ASSESSMENT AND CERTIFICATION

NCCER offers a complete series of entry- and journey-level assessments. These assessments evaluate the knowledge and skill level of an individual in a specific craft area. All assessments are based upon the Contren® Learning Series curriculum and have been developed in conjunction with Prov™, NCCER's test development partner. Certification of an individual's skill level is tracked through NCCER's National Registry.

NCCER also offers a series of academic tests for secondary career and technical education. These tests can assist states implement statewide accountability systems.

- ▶▶ Visit the "Assessments" section at www.nccer.org for more information.



INDUSTRY-RECOGNIZED CREDENTIALS

NCCER maintains a portable and nationally-recognized credentialing and certification system through its National Registry. This National Registry assures portability of skills by providing transcripts, certificates, and wallet cards to students who successfully complete the Contren® Learning Series through an accredited sponsor. These valuable industry credentials benefit students as they seek employment and build their careers. More than 4 million module completions have been delivered to students and craft professionals nationwide.

▶▶ Visit the “Credentials” section at www.nccer.org for more information.

INDUSTRY IMAGE

NCCER directs multiple initiatives aimed at attracting young people into the industry’s workforce and improving the image of the construction industry. As part of this initiative, NCCER recognizes that educational partnerships are key in addressing the workforce shortage in the construction industry. To help and encourage industry and education to work together in their local communities, NCCER provides an array of career resource materials, including the image recruitment campaign *Build Your Future*. This comprehensive campaign includes a career video, Web site with job search functionality, and national Careers in Construction Week every third week in October.

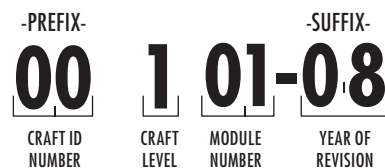
▶▶ Visit the “Careers in Construction” section at www.nccer.org for more information.

A Guide to Understanding NCCER Module Numbers

Module numbers include a craft identifier, the level designation, the sequence in which the module appears in the level, and a suffix indicating the year of revision or publication.

Boilermaking.....	34	Ironworking	30	Residential Electrical	73
Carpentry	27	Masonry	28	Reinforcing Ironwork	39
Concrete Finishing.....	23	Millwright	15	Rigging.....	38
Construction Craft Laborer	35	Mobile Crane Operations.....	21	Safety.....	75
Construction Technology.....	68	Painting (Commercial/Residential; Industrial)	07	Scaffolding	31
Core Curriculum	00	Pipefitting.....	08	Sheet Metal.....	04
Drywall.....	45	Pipelayer.....	24	Site Layout.....	78
Electrical	26	Pipeline Control Center Operations.....	65	Sprinkler Fitting.....	18
Electronic Systems Technician	33	Pipeline Core	66	Welding	29
Heavy Equipment Operations.....	22	Pipeline Corrosion Control.....	61		
Highway/Heavy Construction	36	Pipeline Electrical & Instrumentation	64		
HVAC	03	Pipeline Field Operations, Gas.....	67		
Hydroblasting	43	Pipeline Field Operations, Liquid.....	60		
Industrial Coating	69	Pipeline Maintenance.....	62		
Industrial Maintenance Mechanic	32	Pipeline Mechanical	63		
Industrial Maintenance E & I	40	Plumbing.....	02		
Instrumentation	12	Project Management.....	44		
Insulating	19	Project Supervision	MT200		
Introductory Skills for the Crew Leader.....	MT101	Residential Carpentry.....	72		

To illustrate this further, please refer to the following diagram of the ID number for the first module of the Core Curriculum.



Note: suffixes were not appended until 2000, so any titles published before this year do not include a suffix.



Program Structure

Program Structure

Each Contren® craft area is comprised of successive craft levels and each craft level is comprised of individual units of study called modules. Modules can be treated as separate task-training units. Instructors may teach a single module or the entire craft level. Instructors may even customize their own training programs by combining modules across various craft areas. Whatever the training requirements, Contren® can be easily adapted to cost-effectively meet the needs of your program.

Trainee and Annotated Instructor Guides

Contren® includes illustrated Trainee Guides and Annotated Instructor's Guides. Trainee Guides contain task objectives, task procedures, illustrations, and review questions. Annotated Instructor's Guides feature an annotated version of the Trainee Guide complete with teaching outlines, lab exercises, module examinations, and performance tests.

Note: All curricula revised or published since 1999 have a separate booklet for Module Exams and Answer Keys.

Prices

All prices listed in this catalog reflect net pricing available to schools, government, business, and industry accounts. All prices are accurate as of press time but are subject to change without notice.

Core Curriculum

Core Curriculum is a prerequisite to most Level 1 completions and must be purchased separately.

FORMAT DESCRIPTIONS

Contren® curricula are available in various formats:

Paperback — a soft cover bound book

Hardcover — a hard cover bound book

Binder — three-ring binder, includes modules

Modules — tape-bound or saddle-stitched individual modules

Note: Not all crafts are available in all formats.

PRODUCT SUPPLEMENTS FOR SALE

NCCER also offers a selection of product supplements designed to enhance your program. Ordering information for product supplements is included with each craft.

Note: Not all supplements are available for all crafts.

Computerized Testing Software — is offered with most new and recently revised products. This software allows instructors to scramble the module exam questions in order to print multiple versions of the same test, customize tests to suit various needs, add questions, create a final exam, and print out answer keys.

Transparency Masters — are offered as reproducible paper copies of the overhead transparencies referred to in the Instructor Guides. The Transparency Masters package is comprised of most Trainee Guide graphics, enlarged for projection, and printed on unbound sheets of paper for easy reproduction. Transparency film is not included.

Microsoft PowerPoint® Slide Presentations — are available for all full-color titles, as well as some black & white titles. Each CD-ROM features all of the illustrations as they are sequenced in the Instructor's Guide.

COMPLIMENTARY PRODUCT SUPPLEMENTS

The following product supplements are available at no cost in the "Curriculum" section at www.nccer.org.

Performance Task Checklists — correlate to the performance tasks of NCCER's Contren® curricula and can be used to provide record keeping where documentation of training is required.

Equipment and Material Lists — include all of the equipment and materials required to teach each module of a craft.

Competencies/Objectives Lists — include all competencies and comprehensive learning objectives for each craft.

Revision Maps — track modules from revision to revision. They record new module numbers, show how modules may have been incorporated into revisions, or indicate if they have been deleted.

Share.
Lead.
Inspire.



BECOME A SUBJECT MATTER EXPERT. Do you have journey-level or technician-level experience in your trade? Construction professionals like you are needed to contribute to the Contren® Learning Series, a nationally-recognized and standardized craft training program. SMEs are a vital part of the development process and ensure that Contren® remains current with industry standards.

To become an SME and contribute to building a safe and productive workforce, contact NCCER product development at 888.622.3720.

Assessments

WE'VE GOT YOUR ASSESSMENT NEEDS COVERED!

NCCER offers a complete series of entry- and journey-level assessments for the construction industry and a series of academic tests for secondary career and technical education. All assessments are based upon the Contren® Learning Series curriculum and have been developed in conjunction with Prov™, NCCER's test development partner.

JOURNEY LEVEL

Evaluates journey-level knowledge and skills of experienced craft professionals and provides a training prescription to upgrade training.

- Boiler Technician
- Commercial Carpentry
- Commercial Electrician
- Concrete Finisher*
- Construction Technology
- Core: Introductory Craft Skills*
- Electronic Systems Technician
- Finish Carpentry
- Form Carpentry
- Frame Carpentry
- HVAC
- Hydroblasting Technician
- Industrial Boilermaker
- Industrial Carpentry
- Industrial Coating & Lining Application Specialist 1
- Industrial Electrician
- Industrial Insulation*
- Industrial Ironworker
- Industrial Maintenance: Electrical
- Industrial Maintenance: Mechanical
- Industrial Maintenance Support Mechanic
- Industrial Millwright
- Industrial Painter
- Industrial Pipefitter*

- Instrumentation Fitter
- Instrumentation Technician
- Mobile Crane Operator
- Plumbing
- Reinforcing Iron and Rebar*
- Rigging Fundamentals
- Rigging
- Scaffold Builder*

ENTRY LEVEL

Evaluates the skills of entry-level and new employees.

- Core: Introductory Craft Skills*
- Carpentry Level One
- Construction Technology
- Electrical Level One
- Heavy Equipment Operations Level One
- Masonry Level One*

PIPELINE

Created in conjunction with API to qualify pipeline personnel under the Department of Transportation's (DOT) regulation for Pipeline Operator Qualification.

Gas

- Gas Maintenance Technician
- Gas Pipeline Operations
- Abnormal Operation Conditions-Field

Liquid

- Field Operations Technician
- Control Center Operations Technician
- Mechanical Pipeline Technician

Liquid and Gas

- Electrical and Instrumentation Pipeline Technician
- Corrosion Prevention Field Technician 1-Installation
- Corrosion Prevention Field Technician 1-Measurement
- Corrosion Prevention Field Technician 2
- Corrosion Prevention Field Technician 3
- Custom Pipeline Maintenance Technician
- NDT: Radiographic Film Interpretation of Pipeline Welds
- Pipeline Maintenance Technician

ACADEMIC CAREER TESTS (NCCTs)

Supports objectives for states to implement statewide accountability systems and ideal for high school pre- and post-testing.

- Core: Introductory Craft Skills
- Carpentry Level One
- Construction Technology
- Electrical
- Heavy Equipment Operations Level One
- HVAC
- Masonry Level One
- Welding

*These assessments also available in Spanish



Visit the Assessment section of www.nccer.org to find the right assessment for your organization or call NCCER workforce development at 888.622.3720.



Interactive Online ebooks for Construction Education

Ideal for blended or distance education, Contren® Connect is the perfect way to benefit from the advantages that the Internet has to offer!



Are you looking for a way to:

1. Potentially improve student outcomes?
2. Free up classroom time for more “hands-on” skills work?
3. Improve absenteeism?
4. Expand your reach through distance education?
5. Provide your students with a self-study tool so they can learn at their own pace?
6. Offer your students a way to review content from a lecture they may have missed?
7. Liven up your classroom with an assortment of media tools?
8. Utilize the Internet to offer a blended/hybrid learning component to your program?
9. Save yourself some time?

If you answered “Yes” to any of the above questions, then you owe it to yourself to check out Contren® Connect! Contren® Connect ebooks include all of the content of the print Trainee Guides and much, much more!

CHECK OUT THESE OUTSTANDING FEATURES OF CONTREN® CONNECT EBOOKS!

- **Instructor Toolkit** — Lectures will be exciting and interactive through the use of Video Clips, Active Figures, Lesson Plans, Slide Presentations, and Transparency Masters!
- **Online Lectures** — Each ebook module features a written summary of key content accompanied by an optional Audio Summary so if students miss a class or just need a refresher this tool is always available.
- **Video Presentations** — Most ebooks include dynamic video presentations that demonstrate difficult skills and concepts!
- **Personalization Tools** — With the “highlighter” and “notes” options students can easily personalize their Contren® Connect ebook to keep track of important information.
- **Quizzes** — Short quizzes featuring multiple choice and fill-in-the-blank questions act as the ideal study tool and provide students with immediate feedback.
- **Active Figures** — Interactive exercises engage students in the learning process by bringing key concepts to life!
- **Spanish Content** — Several crafts feature Online Lectures and Audio Summaries in Spanish!

Contren® Connect is now available for the following NCCER crafts:

Core Curriculum

Carpentry Levels 1-4

Electrical Levels 1-4

HVAC Levels 1-4

Plumbing Levels 1-4

Electronic Systems Technician Levels 1-4

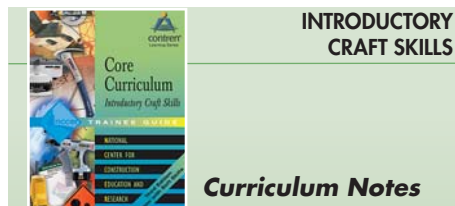
Construction Technology



Don't delay, visit www.contrenconnect.com and VIEW THE DEMO NOW!

Core Curriculum: Introductory Craft Skills

CORE CURRICULUM



INTRODUCTORY CRAFT SKILLS

Curriculum Notes

- Core Curriculum is a prerequisite to all Level 1 completions and must be purchased separately.
- 72.5 Mandatory Hours; 20 Elective/Optional Hours
- Published: 1992 Revised: 2004
- All Trainee Guide formats including individual modules are in full-color.
- Contren Connect online is available with this title. See below for ordering information.
- A Spanish translation of the Trainee Guide and tests is available. See 3rd column of this page for ordering information.

HARDCOVER

Trainee Guide: \$47 **ISBN 0-13-109189-1**

PAPERBACK

Trainee Guide: \$44 **ISBN 0-13-109187-5**

Annotated Instructor's Guide: \$44 **ISBN 0-13-109191-3**



CONTREN CONNECT

Trainee Guide Hardcover + Access Code Package: \$72 **ISBN 0-13-229993-3**

Trainee Guide Paperback + Access Code Package: \$69 **ISBN 0-13-229992-5**

AIG Paperback + Access Code Package: \$144 **ISBN 0-13-229994-1**

Access Code ONLY for Trainee Guide: \$47 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-602592-7**

Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605656-3**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

00101-04 Basic Safety (15 Hours)

Explains the safety obligations of workers, supervisors, and managers to ensure a safe workplace. Discusses the causes and results of accidents and the dangers of rationalizing risk. Reviews the role of company policies and OSHA regulations. Introduces common job-site hazards and protections.

Trainee \$18.00 **ISBN 0-13-160004-4**

Instructor \$18.00 **ISBN 0-13-160013-3**

00102-04 Introduction to Construction Math (15 Hours)

Reviews basic mathematical functions such as adding, subtracting, dividing, and multiplying whole numbers, fractions, and decimals, and explains their applications to the construction trades. Explains decimal-fraction conversions and the metric system using practical examples. Also reviews basic geometry as applied to common shapes and forms.

Trainee \$18.00 **ISBN 0-13-160005-2**

Instructor \$18.00 **ISBN 0-13-160014-1**

00103-04 Introduction to Hand Tools (10 Hours)

Introduces trainees to hand tools that are widely used in the construction industry, such as hammers, saws, levels, pullers, vises, and clamps. Explains the specific applications of each tool and shows how to use them properly. Also discusses important safety and maintenance issues related to hand tools.

Trainee \$18.00 **ISBN 0-13-160006-0**

Instructor \$18.00 **ISBN 0-13-160015-X**

00104-04 Introduction to Power Tools (5 Hours)

Provides detailed descriptions of commonly used power tools such as drills, saws, grinders, and sanders. Reviews applications, proper use, safety, and maintenance. Many illustrations show power tools used in on-the-job settings.

Trainee \$18.00 **ISBN 0-13-160007-9**

Instructor \$18.00 **ISBN 0-13-160016-8**

00105-04 Introduction to Blueprints (7.5 Hours)

Familiarizes trainees with basic blueprint terms, components, and symbols. Explains the different types of blueprint drawings (civil, architectural, structural, mechanical, plumbing/piping, and electrical) and instructs trainees on how to interpret and use drawing dimensions. Two oversized drawings are included.

Trainee \$18.00 **ISBN 0-13-160008-7**

Instructor \$18.00 **ISBN 0-13-160017-6**

00106-04 Basic Rigging (20 Elective Hours)

Explains how ropes, chains, hoists, loaders, and cranes are used to move material and equipment from one location to another on a job site. Describes inspection techniques and load-handling safety practices. Also reviews American National Standards Institute (ANSI) hand signals.

Trainee \$18.00 **ISBN 0-13-160009-5**

Instructor \$18.00 **ISBN 0-13-160018-4**

00107-04 Basic Communication Skills

(5 Elective Hours. Must be combined with 00108-04)

Provides trainees with techniques for communicating effectively with co-workers and supervisors. Includes practical examples that emphasize the importance of verbal and written information and instructions on the job. Also discusses effective telephone and e-mail communication skills.

Trainee \$18.00 **ISBN 0-13-160011-7**

Instructor \$18.00 **ISBN 0-13-160019-2**

00108-04 Basic Employability Skills

(15 Elective Hours. Must be combined with 00107-04)

Identifies the roles of individuals and companies in the construction industry. Introduces trainees to critical thinking and problem solving skills and computer systems and their industry applications. Also reviews effective relationship skills, effective self-presentation, and key workplace issues such as sexual harassment, stress, and substance abuse.

Trainee \$18.00

ISBN 0-13-160012-5

Instructor \$18.00

ISBN 0-13-160020-6

Product Supplements

Computerized Testing Software
ISBN 0-13-109917-5 \$30

Transparency Masters
ISBN 0-13-109904-3 \$25

PowerPoint® Presentation Slides
CD-ROM ISBN 0-13-160001-X \$40

National Construction Career Test available with this title (see p. 7 for more information)

See pp. 10 - 11 for Core Companions and Value Packs

CORE CURRICULUM

IN SPANISH

Curriculum Notes

- Currículo Básico: Habilidades introductorias del oficio: Tercera edición has been translated from the 2004 revision of Core Curriculum: Introductory Craft Skills.
- Only the Trainee Guide, tests and transparency masters have been translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests.
- The translated Trainee Guide is available in full-color. Individual modules are available in one-color.

PAPERBACK

Trainee Guide: \$44 **ISBN 0-13-614409-8**

Instructor's Version: \$44 **ISBN 0-13-614762-3**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

00101-04 Seguridad básica

Trainee \$18.00 **ISBN 0-13-614491-8**

00102-04 Introducción a las matemáticas de la construcción

Trainee \$18.00 **ISBN 0-13-614492-6**

00103-04 Introducción a las herramientas de mano

Trainee \$18.00 **ISBN 0-13-614493-4**

00104-04 Introducción a las herramientas eléctricas

Trainee \$18.00 **ISBN 0-13-614494-2**



Core Curriculum: Companions

00105-04 Introducción a los planos de construcción

Trainee \$18.00 ISBN 0-13-614495-0

00106-04 Operaciones básicas para maniobras de levante

Trainee \$18.00 ISBN 0-13-614497-7

00107-04 Habilidades básicas de comunicación

Trainee \$18.00 ISBN 0-13-614498-5

00108-04 Habilidades básicas de empleabilidad

Trainee \$18.00 ISBN 0-13-614534-5

Product Supplements

Computerized Testing Software

ISBN 0-13-109917-5 \$30
(both the English and Spanish tests are included on the same CD)

Transparency Masters in Spanish

ISBN 0-13-614940-5 \$25

Enhance your construction training with these great supplemental Core Companions. The following titles are an excellent resource for your existing program. They can be used as stand-alone or in combination with the Core Curriculum.

Careers in Construction



NCCER's *Careers in Construction* showcases the world of construction and career opportunities available to high school students and anyone interested in pursuing a construction career. The guide includes a variety of pictures and illustrations as it reviews the pride and excitement of a construction career.

Readers take an extended tour of several work sites, learning about individual construction trades and the

importance of teamwork for successful completion of a project. The book also features profiles of real craft professionals—from recent high school graduates to company owners—who tell firsthand why construction is a good career choice for them.

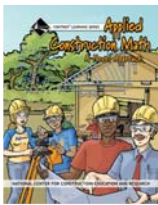
As a special bonus, *Careers in Construction* also includes the *Build Your Future* DVD. This DVD features interviews with craft professionals, project managers, and company owners at construction sites around the country.

PAPERBACK

Trainee Guide: \$15

ISBN 0-13-228605-X

Applied Construction Math



Looking for a “novel” approach to teaching construction math?

Just seeing the word “math” strikes fear and frustration into the hearts and minds of students, but now there is finally a reason to get excited about math. NCCER

introduces a new applied math book that teaches the fundamentals of math in a way that is engaging, interesting and relevant. This novel approach tells the story of a group of construction students tasked to build a house for their class project. Each student learns to simultaneously solve math problems as well as their own personal challenges.

PAPERBACK

Trainee Guide: \$25 ISBN 0-13-227298-9
Instructor's Edition: \$25 ISBN 0-13-227300-4
(includes Resource CD)

CONTENTS:

Chapter 1 Show Me the Money

Mr. Whyte is the teacher and he seizes any opportunity for a math lesson. In Chapter 1, he uses money to teach the students about decimals and fractions as well as division.

Chapter 2 It's All About Space

The students meet with two potential homebuyers and teach them how to calculate the area of squares, rectangles, triangles, and trapezoids.

Chapter 3 Where Do You Live?

Mr. Whyte teaches the class how to calculate the average cost of a home per square foot using powers of ten. He also explains averages.

Chapter 4 Cattle Country

Mr. Whyte finds a homebuyer! His team works with a surveyor to learn about angles, direction and bearing, the 3-4-5 rule for right triangles and the Pythagorean Theorem, as well as more about surface area.

Chapter 5 Breaking Ground

It's time to break ground and the class needs to learn how to estimate the volume of soil for fill and convert between units of measure.

Chapter 6 Payday

It's payday and naturally Mr. Whyte can't pass up an opportunity for a math lesson. This time he uses payroll taxes to teach the relationship between decimals and percentages and how to perform calculations with percentages.

Chapter 7 Divide and Conquer

The class learns how to divide the irregular shape of the foundation into common shapes so they can calculate its total volume.

Chapter 8 Choosing Teams

In this chapter, the rough carpentry team learns about linear measurement and how to read fractional measurements. They also learn how to calculate board feet and perimeters, and how to estimate materials for construction.

Chapter 9 Gravity Can Work for You or Against You

Plumbers use a lot of math, so the students learn about angles, volume, pressure, grades, and slopes. They also get an introduction to trigonometry.

Chapter 10 Shocking, Simply Shocking

Things are really rolling now. The electrical team learns how to calculate the circumference of a circle, more uses for the Pythagorean Theorem, and more about trigonometry.

Chapter 11 First I'm Hot, Then I'm Cold

The teams reunite to install the heating and air conditioning system and to learn how to convert between the Celsius and Fahrenheit scales.

Chapter 12 Inside and Out

The kids learn how to apply math skills to finish the interior and exterior of the house. The math in this chapter includes linear measure and surface area of flat and three-dimensional objects, converting between square feet and yards, pitch and span of roofs, and calculating the material needed for a job.

Chapter 13 The Bottom Line

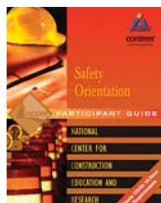
The job is almost done, and the class learns a bit about running a financially sound business by calculating costs and determining profit.

Chapter 14 Everyone Has an Angle

This chapter wraps up trigonometry functions, including sine, cosine, tangent, cotangent, secant, and cosecant.

Core Curriculum: Companions

Safety Orientation



This 10-hour course provides the student and employee with best practices for some of the most common and hazardous situations on the job site.

Provides easy-to-understand terminology on such topics as:

- Elevated Work and Fall Protection
- Electrical Hazards
- Construction Health
- Lockout/Tagout
- Materials Handling
- Emergency Response

This program meets OSHA's requirement for a 10-hour construction industry training program. OSHA 500 Certified Instructors may provide OSHA 10-hour cards to students who successfully complete Safety Orientation.

PAPERBACK

Pocket Guide: \$12 **ISBN 0-13-163612-X**
 Annotated Instructor's Guide: \$22 **ISBN 0-13-163613-8**
(full size; includes tests and transparency masters)

ORIENTACIÓN DE SEGURIDAD

Safety Orientation in Spanish
 Pocket Guide: \$12 **ISBN 0-13-163614-6**
 Annotated Instructor's Guide: \$22 **ISBN 0-13-163615-4**

PRODUCT SUPPLEMENTS:

Safety PowerPoint® Presentation Slides
(One CD includes PowerPoints® for Safety Orientation, Field Safety and Safety Technology)
 CD-ROM: \$80 **ISBN 0-13-163616-2**

Tools for Success



Soft Skills for the Construction Industry

Published: 2000
 Revised: 2004

PAPERBACK

Workbook: \$27 **ISBN 0-13-109194-8**
 Instructor's Edition: \$27 **ISBN 0-13-160000-1**

The Tools for Success Workbook includes classroom activities to help students navigate their way through intangible workplace issues such as conflict resolution, problem-solving and proper communications techniques. Also available, is an instructor's handbook that includes tried and true best practices from instructors teaching the material, as well as answer keys to the practice exercises, and transparency masters.

To review the full table of contents, please visit our online catalog at www.nccer.org

Core Curriculum Value Packs!

You asked for it and we have delivered! For 2008 we will continue to offer "Value Packs" so your trainees can get the best educational materials in one convenient shrink-wrapped package.

Never before have we offered you as many options or as much value!

Here are just a few reasons why you should consider Value Packs for your next order.

- **VALUABLE CONTENT** – Provide your trainees with additional valuable content at a reduced price.
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- **EASY DISTRIBUTION** – Each Value Pack comes conveniently shrink-wrapped so you won't have to waste time gathering items together!



Core TG Hardcover + Safety Orientation Pocket Guide \$56.00 ISBN 0-13-235041-6	X		X			
Core TG Hardcover + Careers in Construction \$59.00 ISBN 0-13-235036-X	X			X		
Core TG Hardcover + Tools for Success, 2/E \$69.00 ISBN 0-13-167768-3	X				X	
Core TG Hardcover + Applied Construction Math \$69.00 ISBN 0-13-235039-4	X					X
Core + Safety + Careers + Tools + Math \$105.00 ISBN 0-13-235031-9	X		X	X	X	X
Core + Contren Connect + Safety + Careers + Tools + Math \$130.00 ISBN 0-13-235033-5	X	X	X	X	X	X



Boilermaking

L1 BOILERMAKING

LEVEL 1

Curriculum Notes

- Total Hours: 170 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 2000

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-030914-1**
 Instructor's Guide: \$60 **ISBN 0-13-030915-X**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

34101 Introduction to Boilermaking (5 Hours)

Provides an overview of the boilermaking field, including the uses of boilers in industry, common terminology used in the field, and a description of the different job opportunities available to a boilermaker.

Trainee \$18.00 **ISBN 0-13-031321-1**
 Instructor \$18.00 **ISBN 0-13-031328-9**

34102 Boilermaking Safety (10 Hours)

Covers specific safety-related issues that exist in a boilermaking environment. Gives special attention to the proper use of safety equipment utilized by boilermakers on the job.

Trainee \$18.00 **ISBN 0-13-031322-X**
 Instructor \$18.00 **ISBN 0-13-031320-3**

34103 Boilermaking Tools (15 Hours)

Introduces the wide variety of hand and power tools used by boilermakers. Discusses hydraulic, pneumatic, and electrical power tools commonly used by a boilermaker with safety given a top priority.

Trainee \$18.00 **ISBN 0-13-031323-8**
 Instructor \$18.00 **ISBN 0-13-031331-9**

34104 Basic Materials (10 Hours)

Provides information to identify the different materials used in the construction of a boiler. Discusses material properties, standards and codes, and standard material markings.

Trainee \$18.00 **ISBN 0-13-031324-6**
 Instructor \$18.00 **ISBN 0-13-031332-7**

34105 Oxyfuel Cutting (17.5 Hours)

Contains information pertaining to the proper and safe use of oxyfuel cutting equipment to cut steel and iron. Discusses safety and the proper operating procedures for this type of equipment.

Trainee \$18.00 **ISBN 0-13-031325-4**
 Instructor \$18.00 **ISBN 0-13-031333-5**

34106 Cutting and Fitting Gaskets (10 Hours)

Describes the various types of gasket materials commonly used in flanges and presents the proper procedure to use for laying out and cutting a flange gasket. Covers proper tightening technique.

Trainee \$18.00 **ISBN 0-13-031326-2**
 Instructor \$18.00 **ISBN 0-13-031334-3**

34107 Welding Basics (30 Hours)

Introduces various welding processes commonly used in the construction of boilers and boiler systems. Discusses proper rod selection, welded joint preparation, shielding gas, and welder certification.

Trainee \$18.00 **ISBN 0-13-031327-0**
 Instructor \$18.00 **ISBN 0-13-031335-1**

Product Supplements

Computerized Testing Software ISBN 0-13-031157-X	\$30
Transparency Masters ISBN 0-13-031165-0	\$20

L2 BOILERMAKING

LEVEL 2

Curriculum Notes

- 170 Hours
- Published: 2001

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-060484-4**
 Instructor's Guide: \$88 **ISBN 0-13-060485-2**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

34201 Introduction to Boiler Components (20 Hours)

Introduces the individual pieces of equipment that make up a boiler.

Trainee \$18.00 **ISBN 0-13-061679-6**
 Instructor \$18.00 **ISBN 0-13-061692-3**

34202 Welding Symbols (5 Hours)

Explains the different parts of a welding symbol and how to read them on drawings, specifications, and welding procedure specifications. Describes fillet welds, groove welds, and non-destructive examination symbols.

Trainee \$18.00 **ISBN 0-13-061670-2**
 Instructor \$18.00 **ISBN 0-13-061693-1**

34203 Drawings and Detail Sheets (12.5 Hours)

Explains plot plans, structural drawings, elevation drawings, as-built drawings, equipment arrangement drawings, P&IDs, isometric drawings, spool sheets, and detail sheets.

Trainee \$18.00 **ISBN 0-13-061681-8**
 Instructor \$18.00 **ISBN 0-13-061694-X**

34204 Identifying and Installing Valves (15 Hours)

Identifies installation procedures for various types of valves and valve actuators. It also explains how to properly store and handle valves.

Trainee \$18.00 **ISBN 0-13-061682-6**
 Instructor \$18.00 **ISBN 0-13-061695-8**

34205 Base Metal Preparation (12.5 Hours)

Describes how to clean and prepare all types of base metals for cutting or welding. Identifies and explains joint design and base metal preparation for all welding tasks.

Trainee \$18.00 **ISBN 0-13-061683-4**
 Instructor \$18.00 **ISBN 0-13-061696-6**

34206 Plasma Arc Cutting (PAC) (12.5 Hours)

Explains plasma arc cutting equipment and safe work area preparation. Identifies correct amperage, gas pressures, and flow rates and plasma arc cutting methods for piercing, slotting, squaring, and beveling metals.

Trainee \$18.00 **ISBN 0-13-061684-2**
 Instructor \$18.00 **ISBN 0-13-061697-4**

34207 Air Carbon Arc Cutting and Gouging (12.5 Hours)

Describes air carbon arc cutting equipment and processes and identifies the electrodes and safe operation of the equipment. Also provides step-by-step instructions for performing air carbon arc washing and gouging activities.

Trainee \$18.00 **ISBN 0-13-061685-0**
 Instructor \$18.00 **ISBN 0-13-061699-0**

34208 Tube Weld Preparation and Fitting (15 Hours)

Identifies preparations and fittings associated with tube welding.

Trainee \$18.00 **ISBN 0-13-061686-9**
 Instructor \$18.00 **ISBN 0-13-061690-7**

34209 Pipe Hangers and Supports (10 Hours)

Identifies pipe hangers and supports found on the job. Explains how to read and interpret pipe support drawings and symbols and how to determine field placement of hangers.

Trainee \$18.00 **ISBN 0-13-061687-7**
 Instructor \$18.00 **ISBN 0-13-061701-6**

Boilermaking

34210 Fasteners (5 Hours)

Describes and explains installation procedures for threaded, non-threaded, and insulation fasteners.

Trainee \$18.00 **ISBN 0-13-061688-5**
 Instructor \$18.00 **ISBN 0-13-061702-4**

34211 Spring Can Supports (10 Hours)

Explains how to identify and select spring can supports. Includes step-by-step procedures for installing and maintaining spring can supports.

Trainee \$18.00 **ISBN 0-13-061689-3**
 Instructor \$18.00 **ISBN 0-13-061703-2**

34212 Butt Weld Pipe Fabrication (40 Hours)

Covers preparing pipe ends for welding and determining the lengths between butt weld fittings. Explains selecting and installing backing rings and fabricating channel iron welding jigs and various types of butt weld fittings to pipe.

Trainee \$18.00 **ISBN 0-13-061691-5**
 Instructor \$18.00 **ISBN 0-13-061704-0**

Product Supplements	
Computerized Testing Software ISBN 0-13-061841-1	\$30
Transparency Masters ISBN 0-13-061820-9	\$25

L3 BOILERMAKING

LEVEL 3

Curriculum Notes

- 150 Hours
- Published: 2001

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-066165-1**
 Instructor's Guide: \$88 **ISBN 0-13-066166-X**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

34301 Boiler Pressure Components (25 Hours)

Describes the pressure components of a boiler plant and discusses several procedures related to boiler safety.

Trainee \$18.00 **ISBN 0-13-035662-X**
 Instructor \$18.00 **ISBN 0-13-035671-9**

34302 Boiler Nonpressure Components (12.5 Hours)

Covers the nonpressure components of a boiler plant along with the theory of operation, boiler construction, and general maintenance procedures.

Trainee \$18.00 **ISBN 0-13-035663-8**
 Instructor \$18.00 **ISBN 0-13-035672-7**

34303 Advanced Tube Work (20 Hours)

Presents information on inspecting, testing, plugging, and replacing boiler tubes.

Trainee \$18.00 **ISBN 0-13-035664-6**
 Instructor \$18.00 **ISBN 0-13-035673-5**

34304 Special Rigging (22.5 Hours)

Introduces some specialized rigging devices and techniques that are used in the boilermaking trade.

Trainee \$18.00 **ISBN 0-13-035665-4**
 Instructor \$18.00 **ISBN 0-13-035674-3**

34305 BRIL (Brick, Refractory, Insulation, and Lagging) (10 Hours)

Covers the types, functions, and hazards of working with BRIL.

Trainee \$18.00 **ISBN 0-13-035666-2**
 Instructor \$18.00 **ISBN 0-13-035675-1**

34306 Boiler Auxiliaries (25 Hours)

Introduces different kinds of boiler auxiliary equipment. Discusses the basic theory of operation, function, purpose, and basic maintenance procedures of boiler auxiliaries.

Trainee \$18.00 **ISBN 0-13-035667-0**
 Instructor \$18.00 **ISBN 0-13-035677-8**

34307 Towers and Exchangers (15 Hours)

Discusses the construction and maintenance of towers and exchangers.

Trainee \$18.00 **ISBN 0-13-035669-7**
 Instructor \$18.00 **ISBN 0-13-035678-6**

34308 Testing Piping Systems and Equipment (20 Hours)

Explains how to perform service, flow, head pressure, hydrostatic, and steam blow tests on piping systems and equipment.

Trainee \$18.00 **ISBN 0-13-035660-3**
 Instructor \$18.00 **ISBN 0-13-035679-4**

Product Supplements	
Computerized Testing Software ISBN 0-13-035659-X	\$30
Transparency Masters ISBN 0-13-035661-1	\$25

L4 BOILERMAKING

LEVEL 4

Curriculum Notes

- 145 Hours
- Published: 2002

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-035657-3**
 Instructor's Guide: \$88 **ISBN 0-13-035658-1**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

34401 Advanced Trade Math (15 Hours)

Presents advanced mathematical skills used in the boilermaking trade. Explains using tables of equivalents and unit conversion tables and the properties of thermal expansion. Covers performing right angle trigonometry and calculating take-outs.

Trainee \$18.00 **ISBN 0-13-009490-0**
 Instructor \$18.00 **ISBN 0-13-009511-7**

34402 Advanced Blueprint Reading (20 Hours)

Explains the graphic information found on P&IDs, piping arrangement drawings, and isometric drawings. Explains reading and interpreting the drawings through the use of related blueprints included with the module.

Trainee \$18.00 **ISBN 0-13-009502-8**
 Instructor \$18.00 **ISBN 0-13-009512-5**

34403 Advanced Towers and Exchangers (20 Hours)

Identifies safety precautions for towers and exchangers. Includes maintenance procedures for a tower, as well as removal and installation of exchangers and trays.

Trainee \$18.00 **ISBN 0-13-009503-6**
 Instructor \$18.00 **ISBN 0-13-009513-3**

34404 Advanced Boiler Tube Systems (20 Hours)

Explains the removal of tubing and attachments, the preparation and installation of tubing, and the materials used to build various components of a boiler system.

Trainee \$18.00 **ISBN 0-13-009504-4**
 Instructor \$18.00 **ISBN 0-13-009514-1**



Boilermaking

34405 Advanced Pipe Fabrication (20 Hours)

Presents advanced skills required for pipe fabrication. Covers safety procedures for shop and portable equipment. Allows trainees to build on the skills learned in this module by fabricating a tank heating coil.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-009505-2
ISBN 0-13-009516-8

34406 Stress Relieving (10 Hours)

Introduces thermal expansion and relief methods available to minimize pipe stressors. Pays particular attention to safety precautions that must be followed for welding or high-heat processes.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-009506-0
ISBN 0-13-009517-6

34407 Quality Assurance (10 Hours)

Introduces the concept of standardization and how it affects day-to-day work. Discusses the governing organizations of boilermaking and how imposed standards are incorporated into procedures used for various boiler components.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-009508-7
ISBN 0-13-009518-4

34408 Boiler Design (20 Hours)

Introduces trainees to different boiler designs and various boiler components used to increase efficiency.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-009509-5
ISBN 0-13-009519-2

34409 Planning Work Activities (10 Hours)

Teaches how to apply the skills presented in previous modules when planning work activities. Also teaches how to incorporate safety requirements, perform material takeoffs, and sequence operations.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-009500-1
ISBN 0-13-009510-9

Product Supplements

Computerized Testing Software ISBN 0-13-009521-4	\$30
Transparency Masters ISBN 0-13-009522-2	\$25



Carpentry

27107-06 Roof Framing (37.5 Hours)

Describes the various kinds of roofs and contains instructions for laying out rafters for gable roofs, hip roofs, and valley intersections. Coverage includes both stick-built and truss-built roofs.

Trainee \$18.00 **ISBN 0-13-229054-5**
 Instructor \$18.00 **ISBN 0-13-229066-9**

27108-06 Introduction to Concrete, Reinforcing Materials, and Forms (5 Hours)

Describes the ingredients of concrete, discusses the various types of concrete, and describes how to mix concrete. The module also covers basic job-built footing, edge, and wall forms and form ties and describes the types and uses of concrete reinforcing materials.

Trainee \$18.00 **ISBN 0-13-229056-1**
 Instructor \$18.00 **ISBN 0-13-229067-7**

27109-06 Windows and Exterior Doors (12.5 Hours)

Describes the various types of windows, skylights, and exterior doors, and provides instructions for installing them. Also includes instructions for installing weather-stripping and locksets.

Trainee \$18.00 **ISBN 0-13-229057-X**
 Instructor \$18.00 **ISBN 0-13-229068-5**

27110-06 Basic Stair Layout (12.5 Hours)

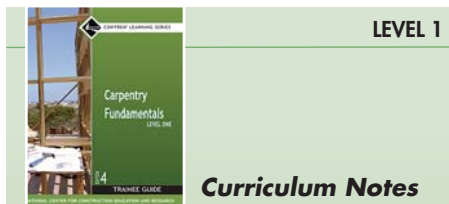
Introduces the trainee to the various types of stairs and the common building code requirements related to stairs. The module focuses on the techniques for measuring and calculating rise, run, and stairwell openings, laying out stringers, and fabricating basic stairways.

Trainee \$18.00 **ISBN 0-13-229058-8**
 Instructor \$18.00 **ISBN 0-13-229034-0**

Product Supplements

Computerized Testing Software ISBN 0-13-229135-5	\$30
Transparency Masters ISBN 0-13-229157-6	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-229136-3	\$40
From the Ground Up: Class Projects for Forming, Framing, and Finishing 2/E See p. 16 for product description.	
Applied Construction Math + Carpentry Fundamentals Hardcover Value Pack (save \$4) Trainee Guide: ISBN 0-13-235034-3	\$83
National Construction Career Test available with this title (see p. 7 for more information)	

L1 CARPENTRY FUNDAMENTALS



LEVEL 1

Curriculum Notes

- Total Hours: 225 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1992 Revised: 2006, Fourth Edition
- All Trainee Guide formats including individual modules are in full-color. The Annotated Instructor's Guide includes a worksheet/job sheet package.
- Contren Connect online is available with this title. See below for ordering information.
- A black & white Spanish translation is available. Only the Trainee Guide, tests and transparency masters will be translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests and job sheets. See below for ordering information.

HARDCOVER

Trainee Guide: \$62 **ISBN 0-13-229268-8**

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-228591-6**

Annotated Instructor's Guide: \$60 **ISBN 0-13-228593-2**

SPANISH VERSION (Paperback)

Trainee Guide: \$60 **ISBN 0-13-605708-X**

Instructor's Version: \$60 **ISBN 0-13-605709-8**

CONTREN CONNECT

Trainee Guide Hardcover + Access Code Package: \$87 **ISBN 0-13-239711-0**

Trainee Guide Paperback + Access Code Package: \$85 **ISBN 0-13-239712-9**

AIG Paperback + Access Code Package: \$160 **ISBN 0-13-239710-2**

Access Code ONLY for Trainee Guide: \$62 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-602824-1**

Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605657-1**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

27101-06 Orientation to the Trade (2.5 Hours)

Reviews the history of the trade, describes the apprentice program, identifies career opportunities for carpentry and construction workers, and lists the responsibilities and characteristics a worker should possess.

Trainee \$18.00 **ISBN 0-13-229047-2**
 Instructor \$18.00 **ISBN 0-13-229059-6**

27102-06 Building Materials, Fasteners, and Adhesives (7.5 Hours)

Provides an overview of the building materials used in construction work, including lumber, sheet materials, engineered wood products, structural concrete, and structural steel. Also describes the various fasteners and adhesives used in construction work.

Trainee \$18.00 **ISBN 0-13-229049-9**
 Instructor \$18.00 **ISBN 0-13-229060-X**

27103-06 Hand and Power Tools (10 Hours)

Provides detailed descriptions of the hand tools and portable power tools used by carpenters. Emphasis is on safe and proper operation of tools, as well as care and maintenance.

Trainee \$18.00 **ISBN 0-13-229050-2**
 Instructor \$18.00 **ISBN 0-13-229061-8**

27104-06 Reading Plans and Elevations (20 Hours)

Builds upon the basic information presented in the *Introduction to Blueprints* module studied in the *Core Curriculum*. Trainees will learn the techniques for reading and using blueprints and specifications with an emphasis placed on those drawings and types of information that are relevant to the carpentry trade. Introduces the subject of quantity takeoffs.

Trainee \$18.00 **ISBN 0-13-229051-0**
 Instructor \$18.00 **ISBN 0-13-229062-6**

27105-06 Floor Systems (25 Hours)

Covers framing basics as well as the procedures for laying out and constructing a wood floor using common lumber as well as engineered building materials.

Trainee \$18.00 **ISBN 0-13-229052-9**
 Instructor \$18.00 **ISBN 0-13-229064-2**

27106-06 Wall and Ceiling Framing (20 Hours)

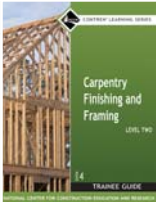
Describes the procedures for laying out and framing walls and ceilings, including roughing-in door and window openings, constructing corners and partition Ts, bracing walls and ceilings, and applying sheathing.

Trainee \$18.00 **ISBN 0-13-229053-7**
 Instructor \$18.00 **ISBN 0-13-229065-0**

Carpentry

L2 CARPENTRY FRAMING & FINISHING

LEVEL 2



Curriculum Notes

- Total Mandatory Hours, Residential Path: 165 hours
- Total Mandatory Hours, Commercial Path: 145 hours
- Total Hours: 215 hours
- Published: 1993 Revised: 2007, Fourth Edition
- All Trainee Guide formats including individual modules are in full-color.
- Contren Connect online is available with this title. See below for ordering information.

HARDCOVER

Trainee Guide: \$90 **ISBN 0-13-614410-1**

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-228596-7**

Annotated Instructor's Guide: \$88 **ISBN 0-13-228598-3**



CONTREN CONNECT

Trainee Guide Hardcover + Access Code Package: \$115 **ISBN 0-13-615056-X**

Trainee Guide Paperback + Access Code Package: \$113 **ISBN 0-13-134914-7**

AIG Paperback + Access Code Package: \$188 **ISBN 0-13-134913-9**

Access Code ONLY for Trainee Guide: \$90 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605658-X**

Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605659-8**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

27201-07 Commercial Drawings (25 Hours)

Elective for Residential Path

Describes the types and uses of drawings prepared for commercial structures. Provides information about the format and content of commercial drawings and their use in conveying specific construction requirements. Describes the standard format for specifications.

Trainee \$18.00 **ISBN 0-13-614477-2**
Instructor \$18.00 **ISBN 0-13-614455-1**

27202-07 Roofing Applications (25 Hours)

Elective for Commercial Path

Covers the common materials used in residential and light commercial roofing, along with the safety practices and application methods for these materials. Includes shingles, roll roofing, shakes, tiles, metal, and membrane roofs, as well as the selection and installation of roof vents.

Trainee \$18.00 **ISBN 0-13-614478-0**
Instructor \$18.00 **ISBN 0-13-614456-X**

27203-07 Thermal and Moisture Protection (7.5 Hours)

Covers the selection and installation of various types of insulating materials in walls, floors, and attics. Also covers the uses and installation practices for vapor barriers and waterproofing materials.

Trainee \$18.00 **ISBN 0-13-614479-9**
Instructor \$18.00 **ISBN 0-13-614457-8**

27204-07 Exterior Finishing (35 Hours)

Elective for Commercial Path

Covers the various types of exterior siding used in residential construction and their installation procedures, including wood, metal, vinyl, and cement board siding.

Trainee \$18.00 **ISBN 0-13-614480-2**
Instructor \$18.00 **ISBN 0-13-614458-6**

27205-07 Cold-Formed Steel Framing (15 Hours)

Describes the types and grades of steel framing materials and includes instructions for selecting and installing metal framing for interior walls, exterior nonbearing walls, and partitions.

Trainee \$18.00 **ISBN 0-13-614481-0**
Instructor \$18.00 **ISBN 0-13-614459-4**

27206-07 Drywall Installation (15 Hours)

Describes the various types of gypsum drywall, their uses, and the fastening devices and methods used to install them. Contains detailed instructions for installing drywall on walls and ceilings using nails, drywall screws, and adhesives. Also covers fire- and sound-rated walls.

Trainee \$18.00 **ISBN 0-13-614482-9**
Instructor \$18.00 **ISBN 0-13-614460-8**

27207-07 Drywall Finishing (12.5 Hours)

Covers the materials, tools, and methods used to finish and patch gypsum drywall. Includes coverage of both automatic and manual taping and finishing tools.

Trainee \$18.00 **ISBN 0-13-614483-7**
Instructor \$18.00 **ISBN 0-13-614461-6**

27208-07 Doors and Door Hardware (20 Hours)

Covers the installation of metal doors and related hardware in steel-framed, wood-framed, and masonry walls, along with their related hardware, such as locksets and door closers. Also covers the installation of wooden doors, folding doors, and pocket doors.

Trainee \$18.00 **ISBN 0-13-614484-5**
Instructor \$18.00 **ISBN 0-13-614463-2**

27209-07 Suspended Ceilings (15 Hours)

Elective for Residential Path

Includes the materials, layout, and installation procedures for many types of suspended ceilings used in commercial construction, as well as ceiling tiles, drywall suspension systems, and pan-type ceilings.

Trainee \$18.00 **ISBN 0-13-614485-3**
Instructor \$18.00 **ISBN 0-13-614499-3**

27210-07 Window, Door, Floor, and Ceiling Trim (25 Hours)

Covers the different types of trim used in finish work. Focuses on the proper methods for selecting, cutting, and fastening trim to provide a professional finished appearance.

Trainee \$18.00 **ISBN 0-13-614486-1**
Instructor \$18.00 **ISBN 0-13-614500-0**

27211-07 Cabinet Installation (10 Hours)

Provides detailed instructions for the selection and installation of base and wall cabinets and countertops.

Trainee \$18.00 **ISBN 0-13-614487-X**
Instructor \$18.00 **ISBN 0-13-614501-9**

27212-07 Cabinet Fabrication (10 Elective Hours)

Provides an introduction to the materials, tools, and methods used in cabinetmaking. Practice projects help the trainee learn the various joining techniques, while providing practice on stationary power tools.

Trainee \$18.00 **ISBN 0-13-614489-6**
Instructor \$18.00 **ISBN 0-13-614502-7**

Product Supplements

Computerized Testing Software ISBN 0-13-229137-1	\$30
Transparency Masters ISBN 0-13-229158-4	\$25
PowerPoint® Presentation Slides ISBN 0-13-229138-X	\$40

From the Ground Up



Published: 2003
Revised: 2006, Second Edition

- This hands-on, activities-based workbook presents over 30 indoor and outdoor projects in basic building, framing, and electrical.

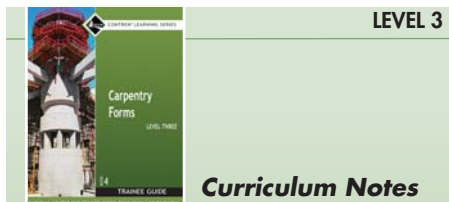
PAPERBACK

Workbook: \$22 **ISBN 0-13-229164-9**
Instructor's Package: \$22 **ISBN 0-13-229165-7**

Includes workbook plus Instructor's Module with answers to review questions and exercises, cross-references to NCCER performance tests, and numerous teaching tips.

Carpentry

L3 CARPENTRY FORMS



LEVEL 3

Curriculum Notes

- Total Hours: 172.5 hours
- Published: 1993 Revised: 2007, Fourth Edition
- All Trainee Guide formats including individual modules are in full-color.
- Contren Connect online is available with this title. See below for ordering information.
- A black & white Spanish translation is planned for 2008. Only the Trainee Guide, tests and transparency masters have been translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests. Ordering information below.

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-228600-9**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-228603-3**

SPANISH VERSION (Paperback)

Trainee Guide: \$88 **ISBN 0-13-605751-9**
 Instructor's Version: \$88 **ISBN 0-13-605752-7**

CONTREN CONNECT

Trainee Guide Paperback
 + Access Code Package: \$113 **ISBN 0-13-134917-1**
 AIG Paperback
 + Access Code Package: \$188 **ISBN 0-13-134915-5**
 Access Code ONLY for Trainee Guide: \$88
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605660-1**
 Access Code ONLY for AIG: \$100
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605661-X**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

27301-07 Rigging Equipment (10 Hours)

Describes the use and inspection of basic equipment and hardware used in rigging, including slings, wire rope, chains, and attaching hardware such as shackles, eyebolts, and hooks, as well as rigging knots. Explains sling angles. Also covers tuggers, jacks, hoists, and come-alongs.

Trainee \$18.00 **ISBN 0-13-614503-5**
 Instructor \$18.00 **ISBN 0-13-614515-9**

27302-07 Rigging Practices (15 Hours)

Describes basic rigging and crane hazards and related safety procedures, provides an overview of personnel lifting and lift planning, and introduces crane load charts and load balancing. Includes instructions for rigging and lifting pipe.

Trainee \$18.00 **ISBN 0-13-614505-1**
 Instructor \$18.00 **ISBN 0-13-614516-7**

27303-07 Properties of Concrete (10 Hours)

Describes the properties, characteristics, and uses of cement, aggregates, and other materials that, when mixed together, form different types of concrete. Covers procedures for estimating concrete volume and testing freshly mixed concrete, as well as methods and materials for curing concrete.

Trainee \$18.00 **ISBN 0-13-614506-X**
 Instructor \$18.00 **ISBN 0-13-614517-5**

27304-07 Reinforcing Concrete (15 Hours)

Explains the selection and uses of different types of reinforcing materials. Describes requirements for cutting, bending, splicing, and tying reinforcing steel and the placement of steel in footings, columns, walls, and slabs.

Trainee \$18.00 **ISBN 0-13-614507-8**
 Instructor \$18.00 **ISBN 0-13-614518-3**

27305-07 Handling and Placing Concrete (22.5 Hours)

Covers tools, equipment, and procedures for handling, placing, and finishing concrete. Also covers joints made in concrete structures, the use of joint sealants, and form removal procedures. Emphasizes safety procedures for handling, placing, and finishing concrete.

Trainee \$18.00 **ISBN 0-13-614508-6**
 Instructor \$18.00 **ISBN 0-13-614519-1**

27306-07 Trenching and Excavating (10 Hours)

Prepares the trainee for working in and around excavations, particularly in preparing building foundations. It covers types and bearing capacities of soils; procedures used in shoring, sloping, and shielding trenches and excavations; trenching safety requirements, including recognition of unsafe conditions; and mitigation of groundwater and rock when excavating foundations.

Trainee \$18.00 **ISBN 0-13-614509-4**
 Instructor \$18.00 **ISBN 0-13-614521-3**

27307-07 Foundations and Slab-on-Grade (20 Hours)

Covers basic site layout tools and methods; layout and construction of deep and shallow foundations; layout and forming of slabs-on-grade; and forms used for curbing and paving.

Trainee \$18.00 **ISBN 0-13-614510-8**
 Instructor \$18.00 **ISBN 0-13-614522-1**

27308-07 Vertical Formwork (27.5 Hours)

Covers the applications and construction methods for various types of forming and form hardware systems for walls, columns, and stairs, as well as slip forms, climbing forms, and shaft forms. The module also provides an overview of the assembly, erection, and stripping of gang forms.

Trainee \$18.00 **ISBN 0-13-614511-6**
 Instructor \$18.00 **ISBN 0-13-614523-X**

27309-07 Horizontal Formwork (22.5 Hours)

Covers the types of elevated decks and the formwork systems and methods used in their construction. It covers joist, pan, metal deck, and flat slab systems and provides instructions for the use of flying forms, as well as shoring and reshoring systems.

Trainee \$18.00 **ISBN 0-13-614513-2**
 Instructor \$18.00 **ISBN 0-13-614524-8**

27310-07 Tilt-Up Wall Panels (20 Hours)

Describes how tilt-up concrete construction is used and how tilt-up panels are formed, erected, and braced. It covers the installation of rebar and the types of embedments used to lift and brace the panels. Methods used to achieve architectural and decorative finishes are also covered.

Trainee \$18.00 **ISBN 0-13-614514-0**
 Instructor \$18.00 **ISBN 0-13-614490-X**

Product Supplements

Computerized Testing Software ISBN 0-13-229104-5	\$30
Transparency Masters ISBN 0-13-229159-2	\$25
PowerPoint® Presentation Slides ISBN 0-13-229106-1	\$40



Carpentry

L4 CARPENTRY ADVANCED

LEVEL 4



Curriculum Notes

- 186 Hours (161 required; 25 elective)
- Published: 1993 To Be Revised: Spring 2008, Fourth Edition
- Contren Connect online is available with this title. See below for ordering information.

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-614411-X**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-614414-4**

BINDER

Trainee Guide: \$93 **ISBN 0-13-614412-8**
 Annotated
 Instructor's Guide: \$93 **ISBN 0-13-614415-2**



CONTREN CONNECT

Trainee Guide Paperback
 + Access Code Package: \$113 **ISBN 0-13-134919-8**
 AIG Paperback
 + Access Code Package: \$188 **ISBN 0-13-134918-X**
 Access Code ONLY for Trainee Guide: \$88
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605666-0**
 Access Code ONLY for AIG: \$100
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605667-9**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

27401-08 Site Layout One – Distance Measurement and Leveling (22.5 Hours)

Covers the equipment, principles, and methods used to perform distance measurement and leveling. Also covers the layout responsibilities of surveyors, field engineers, and carpenters; interpretation and use of site/plot plan drawings; and methods used for on-site communication.

Trainee \$18.00 **ISBN 0-13-603824-7**
 Instructor \$18.00 **ISBN 0-13-603833-6**

27402-08 Site Layout Two – Angular Measurement (30 Hours)

Covers the principles, equipment, and methods used to perform site layout tasks that require making angular measurements. Tasks include laying out building foundation lines and determining elevations by trigonometric leveling. The use of laser instruments, transits, theodolites, electronic distance measurement, and total stations are covered. Reviews trade mathematics, including geometry and right-angle trigonometry, needed to perform the calculations related to angular measurements.

Trainee \$18.00 **ISBN 0-13-603825-5**
 Instructor \$18.00 **ISBN 0-13-603834-4**

27403-08 Advanced Roof Systems (20 Hours)

Covers commercial roofing materials and structures and describes the procedures for installing commercial roofing such as standing seam, lap seam, and built-up roofs.

Trainee \$18.00 **ISBN 0-13-603826-3**
 Instructor \$18.00 **ISBN 0-13-603835-2**

27404-08 Advanced Wall Systems (25 Hours)

Covers installation of a variety of finishing materials, including paneling, and wainscoting. Also covers installation of curtain walls and fire-rated commercial construction.

Trainee \$18.00 **ISBN 0-13-603827-1**
 Instructor \$18.00 **ISBN 0-13-603836-0**

27405-08 Advanced Stair Systems (25 Hours)

Provides extensive coverage of the materials and techniques used in finishing wooden staircases. Also covers a variety of stair systems used in commercial construction.

Trainee \$18.00 **ISBN 0-13-603828-X**
 Instructor \$18.00 **ISBN 0-13-603837-9**

27406-08 Introduction to Light Equipment (10 Hours)

Introduces various pieces of light construction equipment commonly used at a construction site, including the aerial lift, skid steer loader, trencher, electric power generator, compressor, compactor, and forklift. Provides an overview of general safety, operation, and maintenance procedures is given for each type of equipment covered.

Trainee \$18.00 **ISBN 0-13-603829-8**
 Instructor \$18.00 **ISBN 0-13-603839-5**

27407-08 Welding (25 Elective Hours)

Introduces the equipment, procedures, and safety practices used in cutting steel with oxyfuel equipment, as well shielded metal arc welding, gas-tungsten arc welding, and gas metal arc welding. Labs include practice in cutting and welding techniques.

Trainee \$18.00 **ISBN 0-13-603830-1**
 Instructor \$18.00 **ISBN 0-13-603840-9**

NEW! 27408-08 Commercial Finish Work (5 Hours)

Introduces the variety of specialized finish materials used on interior and exterior walls, ceilings, and floors of commercial buildings.

Trainee \$18.00 **ISBN 0-13-603831-X**
 Instructor \$18.00 **ISBN 0-13-603841-7**

NEW! 27409-08 Site Preparation (7.5 Hours)

Covers the planning process that precedes the start of work on a construction site, including environmental considerations, personnel issues, access roads, traffic control, permits, site safety, utilities, and crane-related concerns.

Trainee \$18.00 **ISBN 0-13-603832-8**
 Instructor \$18.00 **ISBN 0-13-603842-5**

27410-08 (MT101) Introductory Skills for the Crew Leader (16 Hours)

Along with the principles of project planning, scheduling, estimating, and management, introduces the basic skills required for supervising personnel. Several case studies are included.

Participant \$40.00 **ISBN 0-13-103593-2**
 Instructor \$60.00 **ISBN 0-13-103594-0**

NOTE: This module is from the Contren® Management Learning Series (see page 100 for more information). Students may be eligible to receive craft and management transcripts from NCCER's National Registry.

Product Supplements

Computerized Testing Software ISBN 0-13-614741-0	\$30
Transparency Masters ISBN 0-13-614792-5	\$25
PowerPoint® Presentation Slides ISBN 0-13-605532-X	\$40

Cabinetmaking



30 Hours
 Published: 2003
 Revised: 2007

27501-07 Cabinetmaking

Updated to reflect current materials, tools, and methods used in cabinetmaking. A full-color insert has been added as well to show different types of custom built cabinetry. Please note that the Annotated Instructor's Guide comes shrinkwrapped with the test and transparency masters.

Trainee: \$22 **ISBN 0-13-614788-7**
 Instructor: \$22 **ISBN 0-13-614789-5**

Concrete Finishing

L1 CONCRETE FINISHING

LEVEL 1

Curriculum Notes

- Total Hours: 160 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1998
- Also available in Spanish. Only the Trainee Guide, tests and transparency masters have been translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests. Ordering information below.

PAPERBACK

Trainee Guide: \$60 ISBN 0-13-010246-6
 Instructor's Guide: \$60 ISBN 0-13-010249-0

BINDER

Trainee Guide: \$65 ISBN 0-13-010247-4
 Instructor's Guide: \$65 ISBN 0-13-010251-2

SPANISH VERSION (Paperback)

Trainee Guide: \$60 ISBN 0-13-605733-0
 Instructor's Version: \$60 ISBN 0-13-605735-7

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

23101 Introduction to Concrete Construction and Finishing (10 Hours)

Provides an introduction to the methods and procedures used in concrete finishing. Introduces terms of the trade and tools and equipment used to place, finish, and cure concrete. Explains methods and techniques for constructing concrete structures.

Trainee \$18.00 ISBN 0-13-010253-9
 Instructor \$18.00 ISBN 0-13-010263-6

23102 Safety Requirements (5 Hours)

Explains safety requirements for concrete construction and finishing. Provides information on OSHA requirements with regard to hazard communication, fall protection, and use of personal protective equipment. Covers topics such as general work site safety, use of chemicals, and safe use of hand and power tools.

Trainee \$18.00 ISBN 0-13-010254-7
 Instructor \$18.00 ISBN 0-13-010264-4

23103 Properties of Concrete (10 Hours)

Introduces the properties of concrete and the components that make up the concrete mixture. Describes chemical and physical properties of cement, aggregate, and admixtures. Explains basic tests used to determine properties such as slump and ultimate strength.

Trainee \$18.00 ISBN 0-13-010255-5
 Instructor \$18.00 ISBN 0-13-010266-0

23104 Tools and Equipment (7.5 Hours)

Describes tools and equipment used in the production, placing, and curing of concrete. Explains safe operation and maintenance requirements. Provides the trainee the opportunity to operate each hand tool and allows the demonstration of larger pieces of power equipment.

Trainee \$18.00 ISBN 0-13-010257-1
 Instructor \$18.00 ISBN 0-13-010267-9

23105 Preparing for Placement (12.5 Hours)

Details the methods and procedures used in preparing for placing concrete. Includes background information about site layout, forms requirements, and subgrade preparation. Describes requirements for various types of joints and reinforcement. Presents information regarding the ordering of concrete from a mixing or batch plant.

Trainee \$18.00 ISBN 0-13-010258-X
 Instructor \$18.00 ISBN 0-13-010268-7

23106 Placing Concrete (12.5 Hours)

Presents requirements and methods for properly placing concrete. Includes information on conveying and placing fresh concrete using various types of equipment, such as wheelbarrows, pumps and conveyors. Describes techniques for spreading, consolidating, and striking off concrete.

Trainee \$18.00 ISBN 0-13-010259-8
 Instructor \$18.00 ISBN 0-13-010269-5

23107 Finishing, Part One (20 Hours)

Describes basic finishing techniques for slabs and other horizontal structures. Explains proper use of floats, trowels, edgers, and groovers and demonstrates their uses. Discusses requirements for cutting joints using different types of saws. Provides hands-on practice for finishing concrete slabs.

Trainee \$18.00 ISBN 0-13-010250-4
 Instructor \$18.00 ISBN 0-13-010260-1

23108 Curing and Protecting Concrete (5 Hours)

Introduces the trainee to the methods and procedures used in curing and protecting concrete. Covers the types of curing commonly performed for both horizontal and vertical placement. Describes techniques for protecting concrete during hot and cold weather.

Trainee \$18.00 ISBN 0-13-010261-X
 Instructor \$18.00 ISBN 0-13-010271-7

23109 Introduction to Troubleshooting (5 Hours)

Describes basic problems for the processes of placing, finishing, and curing. Defines symptoms of each type of problem and discusses their causes. Presents ways to reduce or eliminate these problems.

Trainee \$18.00 ISBN 0-13-010262-8
 Instructor \$18.00 ISBN 0-13-010272-5

Product Supplements

Computerized Testing Software ISBN 0-13-012557-1	\$30
Transparency Masters ISBN 0-13-012555-5	\$20

L2 CONCRETE FINISHING

LEVEL 2

Curriculum Notes

- 165 Hours
- Published: 1998

PAPERBACK

Trainee Guide: \$88 ISBN 0-13-014860-1
 Instructor's Guide: \$88 ISBN 0-13-014872-5

BINDER

Trainee Guide: \$93 ISBN 0-13-014871-7
 Instructor's Guide: \$93 ISBN 0-13-014873-3

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

23201 Properties of Concrete, Part Two (7.5 Hours)

Describes the physical and chemical properties of various materials used in a concrete mix. Includes the description of chemical and mineral admixtures, lightweight concrete, high strength concrete, flowable fill, and various types of paving materials. Discusses expected results of the use of admixtures.

Trainee \$18.00 ISBN 0-13-015047-9
 Instructor \$18.00 ISBN 0-13-015057-6

23202 Estimating Concrete Quantities (10 Hours)

Covers the methods and techniques used in estimating materials quantities for concrete construction. Provides background for use of plans and drawings as well as math calculations. Gives example calculations for estimating quantities of concrete for curb and gutter, stairs, slab, wall footings, and columns.

Trainee \$18.00 ISBN 0-13-015048-7
 Instructor \$18.00 ISBN 0-13-015059-2

23203 Forming (20 Hours)

Describes forming requirements. Includes types of forms, forming materials, use of release agents, form accessories, placement of anchors and embedments, and form removal. Highlights safety requirements with emphasis on reshoring precautions and procedures.

Trainee \$18.00 ISBN 0-13-015049-5
 Instructor \$18.00 ISBN 0-13-015050-9



Concrete Finishing

23204 Site Concrete (30 Hours)

Includes descriptions and techniques for forming, constructing, and finishing various types of site work. Focuses on the construction of steps and stairs, curbs and gutters, sidewalks and driveways, and low vertical structures. Describes different finishing techniques.

Trainee \$18.00 **ISBN 0-13-015040-1**
 Instructor \$18.00 **ISBN 0-13-015061-4**

23205 Architectural Finishes (20 Hours)

Introduces architectural concrete and architectural finishes. Provides information on the surface classes of architectural concrete and the treatments commonly specified to make them attractive. Includes special surface treatments, special forms, and form liners.

Trainee \$18.00 **ISBN 0-13-015051-7**
 Instructor \$18.00 **ISBN 0-13-015062-2**

23206 Industrial Floors (22.5 Hours)

Presents construction and finishing of this special class of concrete work. Describes the use of special tools and finishing techniques. Explains procedures for preparation, joint layout, placing, finishing, and curing.

Trainee \$18.00 **ISBN 0-13-015052-5**
 Instructor \$18.00 **ISBN 0-13-015063-0**

23207 Superflat Floors (22.5 Hours)

Presents requirements for constructing superflat floors and techniques used to achieve required results. Explains procedures for preparation, placing, finishing, and curing. Describes techniques for measuring tolerances of slabs and methods for troubleshooting during placement and finishing. Explains repair procedures.

Trainee \$18.00 **ISBN 0-13-015053-3**
 Instructor \$18.00 **ISBN 0-13-015064-9**

23208 Surface Treatments (12.5 Hours)

Provides an overview of the various types of surface treatments that can be applied to concrete structures. Includes the requirements for and application of dry shakes, self-leveling topping, epoxies, and shotcrete.

Trainee \$18.00 **ISBN 0-13-015054-1**
 Instructor \$18.00 **ISBN 0-13-015065-7**

23209 Quality Control (10 Hours)

Introduces the ideas and tasks related to sampling, testing, and inspecting concrete and its component materials. Describes various types of specifications, along with the standard procedures for sampling and testing concrete mix. Covers inspection procedures for forms, construction methods, and finishing.

Trainee \$18.00 **ISBN 0-13-015055-X**
 Instructor \$18.00 **ISBN 0-13-015067-3**

23210 Making Repairs (10 Hours)

Explains the requirements for making repairs to concrete based on specific problems. Explains and demonstrates repair methods. Describes the use of special tools and materials.

Trainee \$18.00 **ISBN 0-13-015056-8**
 Instructor \$18.00 **ISBN 0-13-015068-1**

Product Supplements	
Computerized Testing Software ISBN 0-13-015500-4	\$30
Transparency Masters ISBN 0-13-015503-9	\$20



Construction Craft Laborer

L1 CONSTRUCTION CRAFT LABORER

LEVEL 1

Curriculum Notes

- 167.5 Hours (includes 72.5 hours of Core Curriculum).
- Published: 1999
- NCCER recommends supplementing this course with the Contren® Safety Orientation program, a certified orientation program for all employees. For ordering information, refer to page 99.
- Construction Craft Laborer is printed on demand and available in Binder format only.

BINDER

Trainee Guide: \$93 **ISBN 0-13-016094-6**
 Instructor's Guide: \$93 **ISBN 0-13-016096-2**

CORE CURRICULUM

00101-04	Basic Safety
00102-04	Basic Math
00103-04	Introduction to Hand Tools
00104-04	Introduction to Power Tools
00105-04	Introduction to Blueprints
00106-04	Basic Rigging
00107-04	Basic Communication Skills
00108-04	Basic Employability Skills

CARPENTRY LEVELS ONE, THREE, & FOUR

27101-06	Orientation to the Trade
27102-06	Building Materials, Fasteners, and Adhesives
27401-08	Site Layout One— Distance Measurements and Leveling
27108-06	Introduction to Concrete, Reinforcing Materials, and Forms
27307-07	Foundations and Slab-on Grade
27304-07	Reinforcing Concrete
27305-07	Handling and Placing Concrete

L2 CONSTRUCTION CRAFT LABORER

LEVEL 2

Curriculum Notes

- 147.5 Hours
- Published: 1999

BINDER

Trainee Guide: \$93 **ISBN 0-13-016095-4**
 Instructor's Guide: \$93 **ISBN 0-13-016097-0**

CARPENTRY LEVEL THREE

27308-07	Vertical Formwork
27309-07	Horizontal Framework

MASONRY LEVEL TWO

28207 Elevated Work

MOBILE CRANE OPERATIONS LEVEL ONE

21101-04 Orientation to the Trade

IRONWORKING LEVEL ONE

30101 Introduction to the Trade

ELECTRICAL LEVEL ONE

26101-05 Electrical Safety

CARPENTRY LEVEL FOUR

27406-08 Introduction to Light Equipment

WELDING LEVEL ONE

29102-03 Oxyfuel Cutting

MASONRY LEVEL THREE

28301-06 Masonry in High-Rise Construction

Construction Technology

CONSTRUCTION TECHNOLOGY



Curriculum Notes

- This curriculum is ideal for programs formatted as Construction Cluster or Building Trades. It consists of modules compiled from four existing NCCER programs. This curriculum is available in full color. It is recommended to begin with Core Curriculum: Introductory Craft Skills. See page 9 for description.
- Total Hours: 342.5
- Published: 2002 Revised: 2006
- Contren Connect online is available with this title. See below for ordering information.

HARDCOVER (one volume)

Trainee Guide: \$140 **ISBN 0-13-228218-6**

PAPERBACK (two volumes shrinkwrapped)

Annotated
Instructor's Guide: \$140 **ISBN 0-13-228219-4**



CONTREN CONNECT

Trainee Guide Paperback
+ Access Code Package: \$165 **ISBN 0-13-233084-9**

AIG Paperback
+ Access Code Package: \$240 **ISBN 0-13-233083-0**

Access Code ONLY for Trainee Guide: \$140
(must be ordered electronically via OASIS;
does not include print book) **ISBN 0-13-605687-3**

Access Code ONLY for AIG: \$140
(must be ordered electronically via OASIS;
does not include print book) **ISBN 0-13-605688-1**

MODULES

- **68101-06** (27202-01 Carpentry Level Two)
Site Layout One — Distance Measurement and Leveling
(22.5 Hours)
- **68102-06** (27203-01 Carpentry Level Two)
Introduction to Concrete and Reinforcing Materials
(10 Hours)
- **68103-06** (27207-01 Carpentry Level Two)
Handling and Placing Concrete (22.5 Hours)
- **68104-06** (28101-04 Masonry Level One)
Introduction to Masonry (20 Hours)
- **68105-06** (28105-04 Masonry Level One)
Masonry Units and Installation Techniques (60 Hours)
- **68106-06** (27104-01 Carpentry Level One)
Floor Systems (25 Hours)
- **68107-06** (27105-01 Carpentry Level One)
Wall and Ceiling Framing (20 Hours)

- **68108-06** (27106-01 Carpentry Level One)
Roof Framing (37.5 Hours)
- **68109-06** (27302-02 Carpentry Level Three)
Roofing Applications (25 Hours)
- **68110-06** (27301-02 Carpentry Level Three)
Exterior Finishing (35 Hours)
- **68111-06** (27304-01 Carpentry Level Three)
Stairs (15 Hours)
- **68112-06** (26101-05 Electrical Level One)
Electrical Safety (12.5 Hours)
- **68113-06** (26111-05 Electrical Level One)
Wiring: Commercial and Industrial (7.5 Hours)
- **68114-06** (02112-05 Plumbing Level One)
Introduction to Drain, Waste and Vent Systems (10 Hours)
- **68115-06** (02106-05 Plumbing Level One)
Plastic Pipe and Fittings (10 Hours)
- **68116-06** (02107-05 Plumbing Level One)
Copper Pipe and Fittings (10 Hours)

Product Supplements

Computerized Testing Software ISBN: 0-13-229116-9	\$30
Transparency Masters ISBN: 0-13-229109-6	\$45
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-229117-7	\$40
National Construction Career Test available with this title (see p. 7 for more information)	





Drywall

L1 DRYWALL



Curriculum Notes

- **Total Hours: 147** (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 9 for ordering information).
- **Published: 2007**
- A Spanish translation is planned for 2008. Only the Trainee Guide, tests and transparency masters have been translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests. Ordering information below.

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-604512-X**
 Annotated
 Instructor's Guide: \$60 **ISBN 0-13-604514-6**

SPANISH VERSION (Paperback)

Trainee Guide: \$60 **ISBN 0-13-605761-6**
 Instructor's Version: \$60 **ISBN 0-13-605762-4**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

45101-07 Orientation to the Trade (5 Hours)

Reviews the history of the trade, shows examples of the work involved, describes the apprentice program, identifies career opportunities for construction workers, and lists the responsibilities and characteristics a worker should possess.

Trainee \$18.00 **ISBN 0-13-604843-9**
 Instructor \$18.00 **ISBN 0-13-604849-8**

45102-07 Construction Materials and Methods (12 Hours)

Gives the trainees an overview of the materials and techniques used in building and finishing residential and commercial buildings, including wood- and steel-framed structures, masonry construction, and concrete-formed structures.

Trainee \$18.00 **ISBN 0-13-604845-5**
 Instructor \$18.00 **ISBN 0-13-604851-X**

45103-07 Thermal and Moisture Protection (7.5 Hours)

Covers the selection and installation of various types of insulating materials in walls, floors, and attics. Also covers the uses and installation practices for vapor barriers and waterproofing materials.

Trainee \$18.00 **ISBN 0-13-604846-3**
 Instructor \$18.00 **ISBN 0-13-604852-8**

45104-07 Drywall Installation (25 Hours)

Describes the various types of gypsum drywall, their uses, and the fastening devices and methods used to install them. Contains detailed instructions for installing drywall on walls and ceilings using nails, drywall screws, and adhesives. Also covers fire- and sound-rated walls.

Trainee \$18.00 **ISBN 0-13-604847-1**
 Instructor \$18.00 **ISBN 0-13-604853-6**

45105-07 Drywall Finishing (25 Hours)

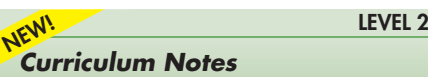
Covers the materials, tools, and methods used to finish and patch gypsum drywall. Includes coverage of both automatic and manual taping tools.

Trainee \$18.00 **ISBN 0-13-604848-X**
 Instructor \$18.00 **ISBN 0-13-604854-4**

Product Supplements

Computerized Testing Software ISBN: 0-13-605530-3	\$30
Transparency Masters ISBN: 0-13-605594-X	\$25

L2 DRYWALL



- **Total Hours: 145**
- **To Be Published: Fall 2008**

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-604480-8**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-604481-6**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

45201-08 Commercial Drawings (25 Hours)

Builds upon the information presented in the Introduction to Blueprints module in Core Curriculum. Covers the techniques for reading and using architectural and structural drawings and specifications.

Trainee \$18.00 **ISBN 0-13-604855-2**
 Instructor \$18.00 **ISBN 0-13-604861-7**

45202-08 Steel Framing (50 Hours)

Describes the types and grades of steel framing and provides instructions for selecting and installing steel framing for interior walls, exterior nonbearing walls, and partitions. Includes coverage of engineered framing systems.

Trainee \$18.00 **ISBN 0-13-604856-0**
 Instructor \$18.00 **ISBN 0-13-604862-5**

45203-08 Acoustical Ceilings (20 Hours)

Covers the materials, layout, and installation procedures for many types of suspended ceilings used in commercial construction, as well as ceiling tiles, drywall suspension systems, and pan-type ceilings.

Trainee \$18.00 **ISBN 0-13-604857-9**
 Instructor \$18.00 **ISBN 0-13-604863-3**

45204-08 Interior Specialties (15 Hours)

Covers the composition and use of various specialty interior finishing products, such as vinyl- and fabric-covered panels, wood wall and ceiling panels, and glass fiber-reinforced gypsum (GFRG) panels.

Trainee \$18.00 **ISBN 0-13-604858-7**
 Instructor \$18.00 **ISBN 0-13-604864-1**

45205-08 Exterior Cladding (20 hours)

Covers a variety of specialized exterior finish products, including EIFS, stucco, synthetic veneer stone, panelized cladding, and glass fiber-reinforced concrete (GFRC) panels.

Trainee \$18.00 **ISBN 0-13-604859-5**
 Instructor \$18.00 **ISBN 0-13-604830-7**

45206-08 Specialty Finishes (15 Hours)

Covers the materials, tools, and application methods used for specialized interior finishes, such as sand, marble, clay, and Venetian plaster.

Trainee \$18.00 **ISBN 0-13-604860-9**
 Instructor \$18.00 **ISBN 0-13-604831-5**

Product Supplements

Computerized Testing Software ISBN: 0-13-605531-1	\$30
Transparency Masters ISBN: 0-13-605595-8	\$25



Electrical

ELECTRICAL CURRICULUM UNDERGOES REVISION TO REFLECT 2008 NEC® UPDATE.

In addition to the code updates throughout, following are the specific changes you'll find per level, plus projected in stock dates.

Level 1—Due Summer 2008

Features a new Orientation to the Electrical Trade module and a completely rewritten Electrical Test Equipment module.

Level 2—Due late Summer 2008

Electric Lighting module revised to include lamps, ballasts, and components. Pull and Junction Boxes revised to cover boxes over 100 cubic inches, with information added on NEC® requirements for handholes. Updated Conductor Installations module to include many new photographs.

Level 3—Due Fall 2008

Practical Applications of Lighting enhanced to include induction and LED lighting. Code-driven worksheet added to Motor Calculations module. New Voice, Data, & Video module covers the role of the electrician in the installation of various types of communications cable.

Level 4—Due December 2008

Includes two new modules. Health Care Facilities covers the specific requirements of medical systems, including emergency power, with heavy emphasis on code requirements. Special Locations covers many of the requirements in NEC® Chapters 5 and 6, and covers various special installations, including places of assembly, temporary installations, wired partitions, agricultural buildings, marinas, and more.

L1 ELECTRICAL



LEVEL 1

Curriculum Notes

- Total Hours: 180 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1992 Revised: 2005 to reflect NEC® update
- All Trainee Guide formats including individual modules are in full-color.
- All Trainee Guides come shrinkwrapped with a workbook including additional practice exercises.
- Contren Connect online is available with this title. See below for ordering information.
- The 2008 NEC® Revision is under way and due in stock Summer 2008. ISBNs, the module sequence, and descriptions appear on the next page.

HARDCOVER

Trainee Guide: \$62 **ISBN 0-13-168447-7**

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-168223-7**

Annotated Instructor's Guide: \$60 **ISBN 0-13-168225-3**



CONTREN CONNECT

Trainee Guide Hardcover + Access Code Package: \$87 **ISBN 0-13-159163-0**

Trainee Guide Paperback + Access Code Package: \$85 **ISBN 0-13-175565-X**

AIG Paperback + Access Code Package: \$160 **ISBN 0-13-175569-2**

Access Code ONLY for Trainee Guide: \$62 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-602825-X**

Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605639-3**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

26101-05 Electrical Safety (12.5 Hours)

Covers safety rules and regulations for electricians. Teaches the necessary precautions to take for various electrical hazards found on the job. Also teaches the OSHA-mandated lockout/tagout procedure.

Trainee \$18.00 **ISBN 0-13-865585-5**
Instructor \$18.00 **ISBN 0-13-865593-6**

26102-05 Hand Bending (7.5 Hours)

Provides an introduction to conduit bending and installation. Covers the techniques for using hand-operated and step conduit benders, as well as cutting, reaming, and threading conduit.

Trainee \$18.00 **ISBN 0-13-865601-0**
Instructor \$18.00 **ISBN 0-13-865619-3**

26103-05 Fasteners and Anchors (5 Hours)

Covers the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. Describes the various types of anchors and supports, their applications, and their safe installation.

Trainee \$18.00 **ISBN 0-13-865627-4**
Instructor \$18.00 **ISBN 0-13-865635-5**

26104-05 Electrical Theory One (7.5 Hours)

Offers a general introduction to the electrical concepts used in Ohm's law applied to DC series circuits. Includes atomic theory, electromotive force, resistance, and electric power equations.

Trainee \$18.00 **ISBN 0-13-865643-6**
Instructor \$18.00 **ISBN 0-13-865650-9**

26105-05 Electrical Theory Two (7.5 Hours)

Introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchoff's voltage and current laws, and circuit analysis.

Trainee \$18.00 **ISBN 0-13-865668-1**
Instructor \$18.00 **ISBN 0-13-865676-2**

26106-05 Electrical Test Equipment (7.5 Hours)

Focuses on proper selection, inspection, use, and maintenance of common electrical test equipment. Allows trainees to practice using many of the instruments while learning the appropriate test procedures and safety rules.

Trainee \$18.00 **ISBN 0-13-865684-3**
Instructor \$18.00 **ISBN 0-13-865692-4**

26107-05 Introduction to the National Electrical Code® (2.5 Hours)

Provides a navigational road map for using the NEC®. Introduces the layout of the NEC® and the types of information found within the code book. Allows trainees to practice finding information using an easy-to-follow procedure.

Trainee \$18.00 **ISBN 0-13-865700-9**
Instructor \$18.00 **ISBN 0-13-865718-1**

26108-05 Raceways, Boxes, and Fittings (12.5 Hours)

Introduces the types and applications of raceways, wireways, and ducts. Stresses the appropriate NEC® requirements.

Trainee \$18.00 **ISBN 0-13-865726-2**
Instructor \$18.00 **ISBN 0-13-865734-3**

Electrical

26109-05 Conductors (15 Hours)

Focuses on the types and applications of conductors and covers proper wiring techniques. Stresses the appropriate NEC® requirements.

Trainee \$18.00 **ISBN 0-13-865742-4**
 Instructor \$18.00 **ISBN 0-13-865759-9**

26110-05 Introduction to Electrical Blueprints (7.5 Hours)

Focuses on electrical prints, drawings, and symbols. Teaches the types of information that can be found on schematics, one-lines, and wiring diagrams.

Trainee \$18.00 **ISBN 0-13-865767-X**
 Instructor \$18.00 **ISBN 0-13-865775-0**

26111-05 Wiring: Commercial and Industrial (7.5 Hours)

Covers the electrical devices and wiring techniques common to commercial and industrial construction and maintenance. Stresses the appropriate NEC® requirements.

Trainee \$18.00 **ISBN 0-13-865783-1**
 Instructor \$18.00 **ISBN 0-13-865791-2**

26112-05 Wiring: Residential (15 Hours)

Covers the electrical devices and wiring techniques common to residential construction and maintenance. Allows trainees to practice making service calculations. Stresses the appropriate NEC® requirements.

Trainee \$18.00 **ISBN 0-13-865809-9**
 Instructor \$18.00 **ISBN 0-13-865817-X**

Product Supplements

Computerized Testing Software ISBN 0-13-168454-X	\$30
Transparency Masters ISBN 0-13-168449-3	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-168455-8	\$40
Performance Projects: Job Sheets for the Electrical Industry ISBN 0-13-228213-5	\$30
The Household Circuit: Class Projects for the Practice of Electrical Principles and Applications 2/E ISBN 0-13-229163-0	\$22
Additional Trainee Workbooks ISBN 0-13-012812-0	\$8
National Construction Career Test available with this title (see p. 7 for more information)	

L1 ELECTRICAL


LEVEL 1

Curriculum Notes

- Total Hours: 185 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 9 for ordering information).
- Published: 1992 To Be Revised: Summer 2008 to reflect NEC® update.
- All Trainee Guide formats including individual modules are in full-color.
- All Trainee Guides come shrinkwrapped with a workbook including additional practice exercises.
- Contren Connect online is available with this title. See below for ordering information.
- A black & white Spanish translation of the Trainee Guide and tests is planned for late 2008. Visit the online catalog at www.nccer.org for ordering information once published.

HARDCOVER

Trainee Guide: \$62 **ISBN 0-13-604459-X**

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-604460-3**

Annotated
 Instructor's Guide: \$60 **ISBN 0-13-604463-8**



CONTREN CONNECT

Trainee Guide Hardcover
 + Access Code Package: \$87 **ISBN 0-13-606193-1**

Trainee Guide Paperback
 + Access Code Package: \$85 **ISBN 0-13-606194-X**

AIG Paperback
 + Access Code Package: \$160 **ISBN 0-13-606160-5**

Access Code ONLY for Trainee Guide: \$62
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605637-7**

Access Code ONLY for AIG: \$100
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605638-5**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

NEW! 26101-08 Orientation to the Trade (2.5 Hours)

Provides an overview of the electrical trade and discusses the career paths available to electricians.

Trainee \$18.00 **ISBN 0-13-604574-X**
 Instructor \$18.00 **ISBN 0-13-604552-9**

26102-08 Electrical Safety (10 Hours)

Covers safety rules and regulations for electricians. Teaches the necessary precautions to take for various electrical hazards found on the job. Also covers the OSHA-mandated lockout/tagout procedure.

Trainee \$18.00 **ISBN 0-13-604575-8**
 Instructor \$18.00 **ISBN 0-13-604554-5**

26103-08 Introduction to Electrical Circuits (7.5 Hours)

Offers a general introduction to the electrical concepts used in Ohm's law applied to DC series circuits. Includes atomic theory, electromotive force, resistance, and electric power equations.

Trainee \$18.00 **ISBN 0-13-604576-6**
 Instructor \$18.00 **ISBN 0-13-604555-3**

26104-08 Electrical Theory (7.5 Hours)

Introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchoff's voltage and current laws, and circuit analysis.

Trainee \$18.00 **ISBN 0-13-604577-4**
 Instructor \$18.00 **ISBN 0-13-604556-1**

26105-08 Introduction to the National Electrical Code® (7.5 Hours)

Provides a navigational road map for using the NEC®. Introduces the layout of the NEC® and the types of information found within the code book. Allows trainees to practice finding information using an easy-to-follow procedure.

Trainee \$18.00 **ISBN 0-13-604578-2**
 Instructor \$18.00 **ISBN 0-13-604557-X**

26106-08 Device Boxes (10 Hours)

Covers the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. Covers NEC® fill and pull requirements for device, pull, and junction boxes under 100 cubic inches.

Trainee \$18.00 **ISBN 0-13-604580-4**
 Instructor \$18.00 **ISBN 0-13-604558-8**

26107-08 Hand Bending (10 Hours)

Provides an introduction to conduit bending and installation. Covers the techniques for using hand-operated and step conduit benders, as well as cutting, reaming, and threading conduit.

Trainee \$18.00 **ISBN 0-13-604581-2**
 Instructor \$18.00 **ISBN 0-13-604594-4**

26108-08 Raceways and Fittings (20 Hours)

Introduces the types and applications of raceways, wireways, and ducts. Stresses the appropriate NEC® requirements.

Trainee \$18.00 **ISBN 0-13-604582-0**
 Instructor \$18.00 **ISBN 0-13-604596-0**

Electrical

26109-08 Conductors and Cables (10 Hours)

Focuses on the types and applications of conductors and covers proper wiring techniques. Stresses the appropriate NEC® requirements.

Trainee \$18.00 ISBN 0-13-604583-9
Instructor \$18.00 ISBN 0-13-604597-9

26110-08 Basic Electrical Construction Drawings (7.5 Hours)

Focuses on electrical prints, drawings, and symbols. Teaches the types of information that can be found on schematics, one-lines, and wiring diagrams.

Trainee \$18.00 ISBN 0-13-604584-7
Instructor \$18.00 ISBN 0-13-604598-7

26111-08 Residential Electric Services (15 Hours)

Covers the electrical devices and wiring techniques common to residential construction and maintenance. Allows trainees to practice making service calculations. Stresses the appropriate NEC® requirements.

Trainee \$18.00 ISBN 0-13-604550-2
Instructor \$18.00 ISBN 0-13-604599-5

26112-08 Electrical Test Equipment (5 Hours)

Focuses on proper selection, inspection, and use of common electrical test equipment, including voltage testers, clamp-on ammeters, ohmmeters, multimeters, phase/motor rotation testers, and data recording equipment. Also covers safety precautions and meter category ratings.

Trainee \$18.00 ISBN 0-13-604551-0
Instructor \$18.00 ISBN 0-13-604600-2

Product Supplements	
Computerized Testing Software ISBN: 0-13-605533-8	\$30
Transparency Masters ISBN: 0-13-605596-6	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-605534-6	\$40
Additional Trainee Workbooks ISBN 0-13-606183-4	\$8



L2 ELECTRICAL LEVEL 2

Curriculum Notes

- 152.5 Hours
- Published: 1993 Revised: 2005 to reflect NEC® update
- All Trainee Guide formats including individual modules are in full-color.
- All Trainee Guides come shrinkwrapped with a workbook including additional practice exercises.
- Contren Connect online is available with this title. See below for ordering information.
- The 2008 NEC® Revision is under way and due in stock late Summer 2008. ISBNs, the module sequence, and descriptions appear on the next page.

HARDCOVER

Trainee Guide: \$90 ISBN 0-13-168448-5

PAPERBACK

Trainee Guide: \$88 ISBN 0-13-168227-X

Annotated Instructor's Guide: \$88 ISBN 0-13-168229-6



CONTREN CONNECT

Trainee Guide Hardcover + Access Code Package: \$115 ISBN 0-13-159164-9

Trainee Guide Paperback + Access Code Package: \$113 ISBN 0-13-175566-8

AIG Paperback + Access Code Package: \$188 ISBN 0-13-175570-6

Access Code ONLY for Trainee Guide: \$90 (must be ordered electronically via OASIS; does not include print book) ISBN 0-13-605680-6

Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) ISBN 0-13-605681-4

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

26201-05 Alternating Current (15 Hours)

Focuses on forces that are characteristic of alternating-current systems and the application of Ohm's law to AC circuits.

Trainee \$18.00 ISBN 0-13-865825-0
Instructor \$18.00 ISBN 0-13-865833-1

26202-05 Motors: Theory and Application (20 Hours)

Covers AC and DC motors, including the main parts, circuits, and connections.

Trainee \$18.00 ISBN 0-13-865841-2
Instructor \$18.00 ISBN 0-13-865858-7

26203-05 Grounding (12.5 Hours)

Focuses on the purpose of grounding and bonding electrical systems. Thoroughly covers NEC® regulations.

Trainee \$18.00 ISBN 0-13-865866-8
Instructor \$18.00 ISBN 0-13-865874-9

26204-05 Conduit Bending (15 Hours)

Covers all types of bends in all sizes of conduit up to 6 inches. Focuses on mechanical, hydraulic, and electrical benders.

Trainee \$18.00 ISBN 0-13-865882-X
Instructor \$18.00 ISBN 0-13-865890-0

26205-05 Boxes and Fittings (10 Hours)

Driven by the NEC®. Explains how to select and size outlet boxes, pull boxes, and junction boxes.

Trainee \$18.00 ISBN 0-13-865908-7
Instructor \$18.00 ISBN 0-13-865916-8

26206-05 Conductor Installations (10 Hours)

Covers the transportation, storage, and setup of cable reels; methods of rigging; and procedures for complete cable pulls in raceways and cable trays.

Trainee \$18.00 ISBN 0-13-865924-9
Instructor \$18.00 ISBN 0-13-865932-X

26207-05 Cable Tray (15 Hours)

Focuses on NEMA and NEC® installation requirements for cable tray, including modifications and cable installations.

Trainee \$18.00 ISBN 0-13-865940-0
Instructor \$18.00 ISBN 0-13-865957-5

26208-05 Conductor Terminations and Splices (7.5 Hours)

Describes methods of terminating and splicing conductors of all types and sizes, including preparing and taping conductors.

Trainee \$18.00 ISBN 0-13-865965-6
Instructor \$18.00 ISBN 0-13-865973-7

26209-05 Installation of Electric Services (15 Hours)

Covers methods and techniques for both single- and three-phase services, including metering equipment and NEC® regulations.

Trainee \$18.00 ISBN 0-13-865981-8
Instructor \$18.00 ISBN 0-13-865999-0

26210-05 Circuit Breakers and Fuses (12.5 Hours)

Describes fuses and circuit breakers along with their practical applications. Covers short-circuit calculation.

Trainee \$18.00 ISBN 0-13-866005-0
Instructor \$18.00 ISBN 0-13-866013-1



Electrical

26211-05 Contactors and Relays (10 Hours)

Gives basic descriptions of various types of contactors and relays along with their practical applications.

Trainee \$18.00

ISBN 0-13-866021-2

Instructor \$18.00

ISBN 0-13-866039-5

26212-05 Electric Lighting (10 Hours)

Introduces the basic principles of human vision and the characteristics of light. Focuses on the handling and installation of the different kinds of lamps (incandescent, fluorescent, and HID) and lighting fixtures (surface mounted, recessed, suspended, and track lighting).

Trainee \$18.00

ISBN 0-13-866047-6

Instructor \$18.00

ISBN 0-13-866054-9

Product Supplements

Computerized Testing Software

ISBN 0-13-168456-6

\$30

Transparency Masters

ISBN 0-13-168450-7

\$25

PowerPoint® Presentation Slides

CD-ROM ISBN 0-13-168457-4

\$40

Performance Projects:

Job Sheets for the Electrical Industry

ISBN 0-13-228215-1

\$30

Additional Trainee Workbooks

ISBN 0-13-012813-9

\$8

The Household Circuit



Class Projects for the Practice of Electrical Principles and Applications, 2/E

Published: 2003

Revised: 2006 to reflect the 2005 NEC® update.

The Household Circuit is a valuable supplement to Electrical Levels 1 and 2. This hands-on, activities-based workbook presents a wide variety of projects in new construction. Competition projects are also featured to help prepare for statewide and national SkillsUSA events.

PAPERBACK

Workbook: \$22

ISBN: 0-13-229163-0

L2 ELECTRICAL



LEVEL 2

Curriculum Notes

- Total Hours: 145
- Published: 1993 To Be Revised: Late Summer 2008 to reflect NEC® update.
- All formats including individual modules are in full-color.
- All Trainee Guides come shrinkwrapped with a workbook including additional practice exercises.
- Contren Connect online is available with this title. See below for ordering information.

HARDCOVER

Trainee Guide: \$90

ISBN 0-13-604465-4

PAPERBACK

Trainee Guide: \$88

ISBN 0-13-604466-2

Annotated

Instructor's Guide: \$88

ISBN 0-13-604468-9



CONTREN CONNECT

Trainee Guide Hardcover

+ Access Code Package: \$115 ISBN 0-13-814334-X

Trainee Guide Paperback

+ Access Code Package: \$113 ISBN 0-13-814335-8

AIG Paperback

+ Access Code Package: \$188 ISBN 0-13-606162-1

Access Code ONLY for Trainee Guide: \$90

(must be ordered electronically via OASIS;

does not include print book) ISBN 0-13-605642-3

Access Code ONLY for AIG: \$100

(must be ordered electronically via OASIS;

does not include print book) ISBN 0-13-605679-2

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

26201-08 Alternating Current (17.5 Hours)

Focuses on forces that are characteristic of alternating-current systems and the application of Ohm's law to AC circuits.

Trainee \$18.00

ISBN 0-13-604601-0

Instructor \$18.00

ISBN 0-13-604613-4

26202-08 Motors: Theory and Application

(20 Hours)

Covers AC and DC motors, including the main components, circuits, and connections.

Trainee \$18.00

ISBN 0-13-604602-9

Instructor \$18.00

ISBN 0-13-604614-2

26203-08 Electric Lighting (15 Hours)

Introduces the basic principles of human vision and the characteristics of light. Focuses on the handling and installation of various types of lamps and lighting fixtures.

Trainee \$18.00

ISBN 0-13-604604-5

Instructor \$18.00

ISBN 0-13-604615-0

26204-08 Conduit Bending (15 Hours)

Covers all types of bends in all sizes of conduit up to 6 inches. Focuses on mechanical, hydraulic, and electrical benders.

Trainee \$18.00

ISBN 0-13-604605-3

Instructor \$18.00

ISBN 0-13-604616-9

26205-08 Pull and Junction Boxes (12.5 Hours)

Driven by the NEC®. Explains how to select and size pull boxes, junction boxes, and handholes.

Trainee \$18.00

ISBN 0-13-604606-1

Instructor \$18.00

ISBN 0-13-604617-7

26206-08 Conductor Installations (10 Hours)

Covers the transportation, storage, and setup of cable reels; methods of rigging; and procedures for complete cable pulls in raceways and cable trays.

Trainee \$18.00

ISBN 0-13-604607-X

Instructor \$18.00

ISBN 0-13-604618-5

26207-08 Cable Tray (7.5 Hours)

Focuses on NEC® installation requirements for cable tray, including cable installations.

Trainee \$18.00

ISBN 0-13-604608-8

Instructor \$18.00

ISBN 0-13-604619-3

26208-08 Conductor Terminations and Splices (7.5 Hours)

Describes methods of terminating and splicing conductors of all types and sizes, including preparing and taping conductors.

Trainee \$18.00

ISBN 0-13-604609-6

Instructor \$18.00

ISBN 0-13-604585-5

26209-08 Grounding and Bonding (15 Hours)

Focuses on the purpose of grounding and bonding electrical systems. Thoroughly covers NEC® requirements.

Trainee \$18.00

ISBN 0-13-604610-X

Instructor \$18.00

ISBN 0-13-604586-3

Electrical

26210-08 Circuit Breakers and Fuses

(12.5 Hours)

Describes fuses and circuit breakers along with their practical applications. Also covers sizing.

Trainee \$18.00 ISBN 0-13-604612-6

Instructor \$18.00 ISBN 0-13-604588-X

26211-08 Control Systems and Fundamental Concepts

(12.5 Hours)

Gives basic descriptions of various types of contactors and relays along with their practical applications.

Trainee \$18.00 ISBN 0-13-604002-0

Instructor \$18.00 ISBN 0-13-604003-9

Product Supplements

Computerized Testing Software ISBN: 0-13-605535-4	\$30
Transparency Masters ISBN: 0-13-605597-4	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-605537-0	\$40
Additional Trainee Workbooks ISBN 0-13-606184-2	\$8

L3 ELECTRICAL

LEVEL 3

Curriculum Notes

- 155 Hours
- Published: 1993 Revised: 2005 to reflect NEC® update
- All formats including individual modules are in full-color.
- Contren Connect online is available with this title. See below for ordering information.
- The 2008 NEC® Revision is under way and due in stock Fall 2008. Ordering information for the Trainee Guide and Annotated Instructor's Guide follows the Product Supplements box.

PAPERBACK

Trainee Guide: \$88 ISBN 0-13-168231-8

Annotated Instructor's Guide: \$88 ISBN 0-13-168233-4



CONTREN CONNECT

Trainee Guide Paperback
+ Access Code Package: \$113 ISBN 0-13-175567-6

AIG Paperback
+ Access Code Package: \$188 ISBN 0-13-175572-2

Access Code ONLY for Trainee Guide: \$28
(must be ordered electronically via OASIS;
does not include print book) ISBN 0-13-605682-2

Access Code ONLY for AIG: \$100
(must be ordered electronically via OASIS;
does not include print book) ISBN 0-13-605683-0

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

26301-05 Load Calculations – Branch Feeders and Circuits

(12.5 Hours)

Introduces the industry standards for electrical work, including the topics of branch circuits, rating and derating, and various types of residential and commercial electrical loads.

Trainee \$18.00 ISBN 0-13-866062-X

Instructor \$18.00 ISBN 0-13-866070-0

26302-05 Conductor Selection and Calculations

(15 Hours)

Covers the types of conductors used in wiring systems, including insulation, current-carrying capacity, and temperature ratings.

Trainee \$18.00 ISBN 0-13-866088-3

Instructor \$18.00 ISBN 0-13-866096-4

26303-05 Overcurrent Protection

(12.5 Hours)

Stresses the use of a variety of overcurrent protection devices, including circuit breakers and fuses, in all types of electrical systems.

Trainee \$18.00 ISBN 0-13-866104-9

Instructor \$18.00 ISBN 0-13-866112-X

26304-05 Raceway, Box, and Fitting Fill Requirements

(12.5 Hours)

Covers the number of conductors allowed in raceways, boxes, and fittings.

Trainee \$18.00 ISBN 0-13-866120-0

Instructor \$18.00 ISBN 0-13-866138-3

26305-05 Wiring Devices

(10 Hours)

Covers popular receptacles and switches and takes an in-depth look at safety switches and other wiring devices.

Trainee \$18.00 ISBN 0-13-866146-4

Instructor \$18.00 ISBN 0-13-866153-7

26306-05 Distribution Equipment

(12.5 Hours)

Explains distribution equipment, including grounding, switchboard and ground fault maintenance, transformers, and electrical drawing identification.

Trainee \$18.00 ISBN 0-13-866161-8

Instructor \$18.00 ISBN 0-13-866179-0

26307-05 Distribution System Transformers

(15 Hours)

Discusses transformer types, construction, connections, protection, and grounding along with capacitors and rectifiers.

Trainee \$18.00 ISBN 0-13-866187-1

Instructor \$18.00 ISBN 0-13-866195-2

26308-05 Lamps, Ballasts, and Components

(5 Hours)

Covers specific types of incandescent, fluorescent, and HID lamps, as well as ballasts, troubleshooting, and various types of lighting controls.

Trainee \$18.00 ISBN 0-13-866203-7

Instructor \$18.00 ISBN 0-13-866211-8

26309-05 Motor Calculations

(12.5 Hours)

Covers single and multi-motor calculations to size conductors, overcurrent protection, and overload protection for motor applications.

Trainee \$18.00 ISBN 0-13-866229-0

Instructor \$18.00 ISBN 0-13-866237-1

26310-05 Motor Maintenance, Part One

(12.5 Hours)

Covers proper maintenance of motors in use and in storage. Includes a troubleshooting and motor identification guide.

Trainee \$18.00 ISBN 0-13-866245-2

Instructor \$18.00 ISBN 0-13-866252-5

26311-05 Motor Controls

(20 Hours)

Provides information on selecting, sizing, and installing motor controllers. Also covers control circuit pilot devices and basic relay logic.

Trainee \$18.00 ISBN 0-13-866260-6

Instructor \$18.00 ISBN 0-13-866278-9

26312-05 Hazardous Locations

(15 Hours)

Covers all classes of hazardous locations, including seals, components, and equipment approved for use in various hazardous locations.

Trainee \$18.00 ISBN 0-13-866302-5

Instructor \$18.00 ISBN 0-13-866310-6

Product Supplements

Computerized Testing Software ISBN 0-13-168458-2	\$30
Transparency Masters ISBN 0-13-168452-3	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-168459-0	\$40
Performance Projects: Job Sheets for the Electrical Industry ISBN 0-13-228216-X	\$30
Additional Trainee Workbooks ISBN 0-13-015818-6	\$8

Ordering Information for 2008 NEC revision due Fall 2008:

PAPERBACK

Trainee Guide: \$88 ISBN 0-13-604471-9

Annotated Instructor's Guide: \$88 ISBN 0-13-604473-5



Electrical

L4 ELECTRICAL

LEVEL 4

Curriculum Notes

- 155 Hours
- Published: 1993 Revised: 2005 to reflect NEC® update
- All formats including individual modules are in full-color.
- Contren Connect online is available with this title. See below for ordering information.
- The 2008 NEC® Revision is under way and due in stock December 2008. Ordering information for the Trainee Guide and Annotated Instructor's Guide follows the Product Supplements box.

PAPERBACKTrainee Guide: \$88 **ISBN 0-13-168235-0**Annotated
Instructor's Guide: \$88 **ISBN 0-13-168237-7****CONTREN CONNECT**Trainee Guide Paperback
+ Access Code Package: \$113 **ISBN 0-13-175568-4**AIG Paperback
+ Access Code Package: \$188 **ISBN 0-13-175573-0**Access Code ONLY for Trainee Guide: \$88
(must be ordered electronically via OASIS;
does not include print book) **ISBN 0-13-605685-7**Access Code ONLY for AIG: \$100
(must be ordered electronically via OASIS;
does not include print book) **ISBN 0-13-605686-5****MODULES**

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

26401-05 Load Calculations – Feeders and Services (15 Hours)

Describes basic calculation procedures and calculations for commercial and residential applications.

Trainee \$18.00 **ISBN 0-13-866328-9**Instructor \$18.00 **ISBN 0-13-866336-X****26402-05 Practical Applications of Lighting (10 Hours)**

Covers various lighting installations, applications, and wiring systems.

Trainee \$18.00 **ISBN 0-13-866344-0**Instructor \$18.00 **ISBN 0-13-866351-3****26403-05 Standby and Emergency Systems (12.5 Hours)**

Explains NEC® installation requirements for electric generators and storage.

Trainee \$18.00 **ISBN 0-13-866385-8**Instructor \$18.00 **ISBN 0-13-866393-9****26404-05 Basic Electronic Theory (20 Hours)**

Explains the function and operation of basic electronic devices, including semiconductors, diodes, rectifiers, and transistors.

Trainee \$18.00 **ISBN 0-13-866401-3**Instructor \$18.00 **ISBN 0-13-866419-6****26405-05 Fire Alarm Systems (15 Hours)**

Covers fire alarm control units, Digital Alarm Communicator Systems (DACS), installation wiring for alarm initiating and notification devices, and alarm system maintenance.

Trainee \$18.00 **ISBN 0-13-866427-7**Instructor \$18.00 **ISBN 0-13-866435-8****26406-05 Specialty Transformers (15 Hours)**

Covers various types of transformers and their applications. Also provides information on selecting, sizing, and installing these devices.

Trainee \$18.00 **ISBN 0-13-866443-9**Instructor \$18.00 **ISBN 0-13-866450-1****26407-05 Advanced Motor Controls (20 Hours)**

Explains applications and operating principles of solid-state controls, reduced-voltage starters, and adjustable frequency drives. Also covers basic troubleshooting procedures.

Trainee \$18.00 **ISBN 0-13-866468-4**Instructor \$18.00 **ISBN 0-13-866476-5****26408-05 HVAC Controls (15 Hours)**

Provides a basic overview of HVAC systems and their controls. Stresses electrical trouble shooting and NEC® requirements.

Trainee \$18.00 **ISBN 0-13-866484-6**Instructor \$18.00 **ISBN 0-13-866492-7****26409-05 Heat Tracing and Freeze Protection (10 Hours)**

Covers various heat tracing systems along with their applications and installation requirements.

Trainee \$18.00 **ISBN 0-13-866534-6**Instructor \$18.00 **ISBN 0-13-866526-5****26410-05 Motor Maintenance, Part Two (12.5 Hours)**

Covers motor cleaning, testing, and preventative maintenance. Also describes basic troubleshooting procedures.

Trainee \$18.00 **ISBN 0-13-866542-7**Instructor \$18.00 **ISBN 0-13-866559-1****26411-05 High-Voltage Terminations/Splices (10 Hours)**

Offers an overview of the NEC® and cable manufacturers' requirements for high voltage terminations and splices.

Trainee \$18.00 **ISBN 0-13-866567-2**Instructor \$18.00 **ISBN 0-13-866575-3****Product Supplements**

Computerized Testing Software ISBN 0-13-168463-9	\$30
Transparency Masters ISBN 0-13-168453-1	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-168464-7	\$40
Performance Projects: Job Sheets for the Electrical Industry ISBN 0-13-228217-8	\$30
Additional Trainee Workbooks ISBN 0-13-015810-0	\$8

Ordering Information for 2008 NEC revision due December 2008:

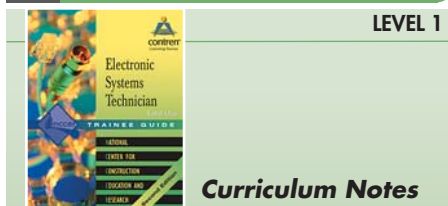
PAPERBACKTrainee Guide: \$88 **ISBN 0-13-604475-1**Annotated
Instructor's Guide: \$88 **ISBN 0-13-604477-8****Advanced Electrical Topics**

Much of the technology in emerging fields—such as wireless, integrated, and voice and data system—has evolved greatly since the publication of Advanced Electrical Topics Volumes One and Two. Because of this, NCCER and Pearson suggest that those teaching a five-year electrical apprenticeship program use the following compilation of modules drawn from the EST and Instrumentation programs:

Cable Selection	33301-04
Wire and Cable Terminations	33208-05
CCTV Systems	33405-03
Access Control Systems	33407-03
Bussees and Networks	33302-04
Fiber Optics	33303-04
Programmable Logic Controllers	12406-03
Broadband Systems	33406-03
Distributed Control Systems	12407-03
Intrusion Detection Systems	33402-03
Audio Systems	33403-03
Nurse Call Systems	33404-03

Electronic Systems Technician

L1 ELECTRONIC SYSTEMS TECHNICIAN



LEVEL 1

Curriculum Notes

- Total Hours: 167.5 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1999 Revised: 2004
- Contren Connect online is available with this title. See below for ordering information.

PAPERBACK

Trainee Guide: \$60 ISBN 0-13-109195-6

Annotated Instructor's Guide: \$60 ISBN 0-13-109197-2



CONTREN CONNECT

Trainee Guide Paperback + Access Code Package: \$85 ISBN 0-13-239714-5

AIG Paperback + Access Code Package: \$160 ISBN 0-13-239713-7

Access Code ONLY for Trainee Guide: \$60 (must be ordered electronically via OASIS; does not include print book) ISBN 0-13-605689-X

Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) ISBN 0-13-605690-3

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

33101-04 Introduction to the Trade (10 Hours)

Provides an overview of the alarm, telecommunications, and entertainment electronics industries from a technician's perspective. Also introduces the elements of professional conduct and trainees' responsibilities to themselves and their employers, customers, and fellow workers.

Trainee \$18.00 ISBN 0-13-167386-6
Instructor \$18.00 ISBN 0-13-167396-3

33102-04 Construction Materials and Methods (17.5 Hours)

Gives the trainees an overview of the materials and techniques used in constructing and finishing all forms of residential and commercial buildings, including wood and metal frame, brick and block, post and beam, poured and prefabricated concrete, and structural steel. Covers the various drills, bits, and techniques used to drill through various construction materials.

Trainee \$18.00 ISBN 0-13-167388-2
Instructor \$18.00 ISBN 0-13-167397-1

33103-04 Pathways and Spaces (15 Hours)

Introduces the many types of conduits and wireways used in low-voltage applications, along with their supporting hardware. Provides an overview of telecommunications cable pathways from the source to the destination, including maintenance holes, ducts, equipment rooms, and telecommunications closets.

Trainee \$18.00 ISBN 0-13-167389-0
Instructor \$18.00 ISBN 0-13-167398-X

33104-04 Fasteners and Anchors (5 Hours)

Covers the hardware and systems used by a low-voltage technician to mount and support boxes, receptacles, and other electrical components. Discusses the various types of anchors and supports, their applications, and how to install them safely.

Trainee \$18.00 ISBN 0-13-167390-4
Instructor \$18.00 ISBN 0-13-167399-8

33105-04 Job-Site Safety (12.5 Hours)

Covers safety rules and regulations for electricians. Describes the necessary precautions to take for various electrical hazards found on the job. Also teaches the OSHA-mandated lockout/tagout procedure.

Trainee \$18.00 ISBN 0-13-167391-2
Instructor \$18.00 ISBN 0-13-167400-5

33106-04 Craft-Related Mathematics (10 Hours)

Expands on the knowledge gained in the Core Curriculum module, Introduction to Construction Math. Emphasizes the metric system, including how to convert between corresponding English and metric system units. Also covers the use of scientific notation, powers and roots, and the basic concepts of algebra, geometry, and right-angle trigonometry.

Trainee \$18.00 ISBN 0-13-167392-0
Instructor \$18.00 ISBN 0-13-167401-3

33107-04 Hand Bending of Conduit (7.5 Hours)

Provides an introduction to conduit bending and installation. Covers the techniques for using hand-operated and step conduit benders, as well as cutting, reaming, and threading conduit.

Trainee \$18.00 ISBN 0-13-167393-9
Instructor \$18.00 ISBN 0-13-167402-1

33108-04 Low-Voltage Cabling (20 Hours)

Covers the makeup, identification, and applications of various types of conductors and cables used in telecommunications and security systems. Describes the tools, materials, and procedures for pulling cables through conduit and raceways.

Trainee \$18.00 ISBN 0-13-167394-7
Instructor \$18.00 ISBN 0-13-167404-8

Product Supplements

Computerized Testing Software ISBN 0-13-109905-1	\$30
Transparency Masters ISBN 0-13-109891-8	\$25
NEW! PowerPoint® Presentation Slides (in color) CD-ROM ISBN 0-13-602615-X	\$40

L2 ELECTRONIC SYSTEMS TECHNICIAN

LEVEL 2

Curriculum Notes

- 157.5 Hours
- Published: 2000 Revised: 2005
- Contren Connect online is available with this title. See below for ordering information.

PAPERBACK

Trainee Guide: \$88 ISBN 0-13-109199-9

Annotated Instructor's Guide: \$88 ISBN 0-13-109201-4



CONTREN CONNECT

Trainee Guide Paperback + Access Code Package: \$113 ISBN 0-13-239717-X

AIG Paperback + Access Code Package: \$188 ISBN 0-13-239715-3

Access Code ONLY for Trainee Guide: \$88 (must be ordered electronically via OASIS; does not include print book) ISBN 0-13-605691-1

Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) ISBN 0-13-605693-8

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

33201-05 DC Circuits (12.5 Hours)

Offers a general introduction to the electrical concepts used in Ohm's law as applied to DC series circuits. Includes atomic theory, electromotive force, resistance, and electrical power equations. Introduces series, parallel, and series-parallel DC circuits. Covers Kirchoff's voltage and current laws and circuit analysis.

Trainee \$18.00 ISBN 0-13-168260-1
Instructor \$18.00 ISBN 0-13-168271-7

33202-05 AC Circuits (15 Hours)

Provides an introduction to AC theory, circuits, and components, including inductors, capacitors, and transformers. Covers the calculation of reactance and impedance in RL, RC, LC, and RLC circuits using math and vector analysis.

Trainee \$18.00 ISBN 0-13-168262-8
Instructor \$18.00 ISBN 0-13-168272-5



Electronic Systems Technician

33203-05 Semiconductors and Integrated Circuits (10 Hours)

Provides an introduction to the principles of electronics and semiconductor theory, components, and applications.

Trainee \$18.00 **ISBN 0-13-168263-6**
 Instructor \$18.00 **ISBN 0-13-168273-3**

33204-05 Basic Test Equipment (10 Hours)

Covers selection, inspection, use, and maintenance of the analog and digital meters used in the installation and checkout of electronic systems.

Trainee \$18.00 **ISBN 0-13-168264-4**
 Instructor \$18.00 **ISBN 0-13-168274-1**

33205-05 Power Quality and Grounding (20 Hours)

Covers grounding and bonding of electrical systems. Discusses NEC® regulations pertaining to grounding and bonding. Covers equipment and devices used for grounding and bonding, including their methods of installation. Explains power quality, along with the causes and effects of poor power quality.

Trainee \$18.00 **ISBN 0-13-168265-2**
 Instructor \$18.00 **ISBN 0-13-168275-X**

33206-05 Introduction to Electrical Blueprints (7.5 Hours)

Introduces electrical prints, drawings, and symbols. Teaches the types of information that can be found on schematics, one-line drawings, and wiring diagrams.

Trainee \$18.00 **ISBN 0-13-168266-0**
 Instructor \$18.00 **ISBN 0-13-168276-8**

33207-05 Switching Devices and Timers (12.5 Hours)

Presents the principles of operation and describes the different types and configurations of switches, relays, timers, and photoelectric devices. Covers guidelines for the selection of appropriate devices using specification sheets.

Trainee \$18.00 **ISBN 0-13-168267-9**
 Instructor \$18.00 **ISBN 0-13-168277-6**

33208-05 Wire and Cable Terminations (20 Hours)

Provides information and detailed instructions for selecting, installing, and testing connectors and other terminating devices on the various cables used in low-voltage work, including telecommunications, video and audio, and fiber optics.

Trainee \$18.00 **ISBN 0-13-168268-7**
 Instructor \$18.00 **ISBN 0-13-168278-4**

33209-05 Introduction to Codes and Standards (10 Hours)

Describes the scope and content of the major codes and standards that apply to telecommunications, life safety, security, and other low-voltage systems. Emphasis on familiarization with and use of the NEC®.

Trainee \$18.00 **ISBN 0-13-168269-5**
 Instructor \$18.00 **ISBN 0-13-168280-6**

33210-05 Computer Applications (20 Hours)

Provides an introduction to computer hardware and software, as well as the types and uses of computer networks. Explains many terms used in conjunction with computers and computer networks. Also introduces the trainee to computer troubleshooting.

Trainee \$18.00 **ISBN 0-13-168270-9**
 Instructor \$18.00 **ISBN 0-13-168281-4**

33211-05 Advanced Test Equipment (20 Hours)

Covers test devices, such as oscilloscopes, signal generators, meggers, wattmeters, frequency meters, cable testers, and RF analyzers, used in troubleshooting cabling systems.

Trainee \$18.00 **ISBN 0-13-169048-5**
 Instructor \$18.00 **ISBN 0-13-169049-3**

33301-04 Cable Selection (15 Hours)

Provides an overview of the types of cable used for various low-voltage installations. Also covers the methods used to select the proper size and type of cable for a typical installation.

Trainee \$18.00 **ISBN 0-13-031288-6**
 Instructor \$18.00 **ISBN 0-13-031305-X**

33302-04 Buses and Networks (25 Hours)

Provides information on connecting computers and components, including various methods for connecting computers in a network, information on connecting controls and equipment in a control system, and information on how data is transferred between the nodes in a network.

Trainee \$18.00 **ISBN 0-13-031289-4**
 Instructor \$18.00 **ISBN 0-13-031306-8**

33303-04 Fiber Optics (20 Hours)

Introduces the types of equipment and methods used in fiber-optic cable installation.

Trainee \$18.00 **ISBN 0-13-031280-0**
 Instructor \$18.00 **ISBN 0-13-031307-6**

33304-04 Video Systems (15 Hours)

Introduces the types of equipment used in various video systems. Describes the operation of the various types of video systems.

Trainee \$18.00 **ISBN 0-13-031291-6**
 Instructor \$18.00 **ISBN 0-13-031308-4**

33305-04 Wireless Communication (15 Hours)

Introduces the operating principles and equipment used in common types of radio frequency (RF) and infrared (IR) wireless communication systems. Covers RF communication systems, IR-controlled systems, power line carrier (PLC) systems, RF and IR wireless computer networks, and satellite communication systems. Discusses the equipment used for testing and troubleshooting wireless communication systems.

Trainee \$18.00 **ISBN 0-13-031292-4**
 Instructor \$18.00 **ISBN 0-13-031309-2**

33306-04 Site Survey, Project Planning, and Documentation (15 Hours)

Covers the tasks involved in planning a job from start to finish, including how to perform site surveys for both new and retrofit construction projects. Covers the different kinds of drawings, specifications, and other documents commonly used.

Trainee \$18.00 **ISBN 0-13-031293-2**
 Instructor \$18.00 **ISBN 0-13-031300-9**

33307-04 Maintenance and Repair (15 Hours)

Introduces the background information and the tasks involved in the maintenance and repair of low-voltage systems and equipment. Covers a systematic approach to system and component-level troubleshooting and the methods of identifying common types of repairs.

Trainee \$18.00 **ISBN 0-13-031294-0**
 Instructor \$18.00 **ISBN 0-13-031312-2**

Product Supplements

Computerized Testing Software ISBN 0-13-109906-X	\$30
Transparency Masters ISBN 0-13-109892-6	\$25
NEW! PowerPoint® Presentation Slides (in color) CD-ROM ISBN 0-13-602617-6	\$40

L3 ELECTRONIC SYSTEMS TECHNICIAN

LEVEL 3

Curriculum Notes

- 151 Hours
- Published: 2001 Revised: 2004
- Contren Connect online is available with this title. See below for ordering information.

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-109203-0**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-109205-7**



CONTREN CONNECT

Trainee Guide Paperback
 + Access Code Package: \$113 **ISBN 0-13-158722-6**

AIG Paperback
 + Access Code Package: \$188 **ISBN 0-13-158721-8**

Access Code ONLY for Trainee Guide: \$88
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605694-6**

Access Code ONLY for AIG: \$100
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605695-4**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

Electronic Systems Technician

33308-04 (MT101) Introductory Skills for the Crew Leader (16 hours)

Teaches the basic skills required to supervise personnel. Discusses principles of project planning and management and presents several case studies for student participation.

Participant \$40.00 **ISBN 0-13-103593-2**
 Instructor \$60.00 **ISBN 0-13-103594-0**

NOTE: This module is from the Contren® Management Learning Series (see page 100 for more information). Students may be eligible to receive craft and management transcripts from NCCER's National Registry.

33309-04 Rack Systems (15 Hours)

Describes rack systems and best practices for assembling electronic system enclosures including power sequencing, grounding, weight distribution, and heat dissipation. Explains electrical power distribution and load calculations for equipment housed within racks.

Trainee \$18.00 **ISBN 0-13-109081-X**
 Instructor \$18.00 **ISBN 0-13-109082-8**

Product Supplements	
Computerized Testing Software ISBN 0-13-109907-8	\$30
Transparency Masters ISBN 0-13-109894-2	\$25

L4 ELECTRONIC SYSTEMS TECHNICIAN

LEVEL 4

Curriculum Notes

- 235 Hours (150 Hours mandatory for level completion)
- Published: 2003
- Contren Connect online is available with this title. See below for ordering information.

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-102601-1**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-102602-X**

CONTREN CONNECT

Trainee Guide Paperback
 + Access Code Package: \$113 **ISBN 0-13-158724-2**

AIG Paperback
 + Access Code Package: \$188 **ISBN 0-13-158723-4**

Access Code ONLY for Trainee Guide: \$88
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605696-2**

Access Code ONLY for AIG: \$100
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605697-0**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

33401-03 Fire Alarm Systems (40 Hours)

Covers the basics of fire alarm systems, including devices, circuits, system design and installation guidelines, power requirements, control panel programming, testing, and troubleshooting. Explores integration of fire alarms with other systems. Examines both residential and commercial fire alarm applications. Emphasizes the NEC®.

Trainee \$18.00 **ISBN 0-13-109084-4**
 Instructor \$18.00 **ISBN 0-13-109095-X**

33402-03 Intrusion Detection Systems (30 Hours)

Introduces intrusion detection security systems. Describes devices such as sensors, notification, control panels, and programming. Covers system design and installation guidelines, wiring, testing, and troubleshooting. Emphasizes codes and standards.

Trainee \$18.00 **ISBN 0-13-109085-2**
 Instructor \$18.00 **ISBN 0-13-109096-8**

33403-03 Audio Systems (40 Hours)

Introduces and explains audio system components, including input sources, amplifiers, signal processing equipment, and output equipment. Describes power requirements, cabling options, system configuration, and basic design considerations. Reviews common test equipment used for installation and troubleshooting.

Trainee \$18.00 **ISBN 0-13-109086-0**
 Instructor \$18.00 **ISBN 0-13-109097-6**

33404-03 Overview of Nurse Call and Signaling Systems (10 Hours)

Presents an overview of nurse call and signaling systems as found in hospitals and other health-care facilities. Covers basic emergency call and duress system requirements based on facility type. Identifies installation requirements based on UL and other building code specifications.

Trainee \$18.00 **ISBN 0-13-109087-9**
 Instructor \$18.00 **ISBN 0-13-109098-4**

33405-03 CCTV Systems (20 Hours)

Describes the installation and configuration of closed circuit TV systems for small, medium, and large facilities. Explains various equipment, including cameras, lenses, remote-positioning, video recording, and transmission. Covers the roles of the internet and digital technologies. Introduces test and troubleshooting equipment.

Trainee \$18.00 **ISBN 0-13-109088-7**
 Instructor \$18.00 **ISBN 0-13-109099-2**

33406-03 Broadband Systems (15 Hours)

Describes the major elements of head-end design for specialized television systems, including CATV, SMATV, and MATV systems. Explains receivers, modulators, amplification, and distribution devices. Explains proper signal levels, cable attenuation, insertion loss, and acceptable carrier-to-noise levels. Covers common test equipment and troubleshooting procedures.

Trainee \$18.00 **ISBN 0-13-109089-5**
 Instructor \$18.00 **ISBN 0-13-109113-1**

33407-03 Access Control Systems (30 Hours)

Introduces access control systems, including applications, door locking systems, readers, biometrics, and controllers. Emphasizes installation practices as well as building and electrical codes.

Trainee \$18.00 **ISBN 0-13-109090-9**
 Instructor \$18.00 **ISBN 0-13-109114-X**

33408-03 Systems Integration (20 Hours)

Presents concepts for connecting two or more stand-alone systems together. Emphasizes how to improve the capabilities of each system. Describes the best practices for interoperability and system performance. Discusses various interconnection options and integration protocols. Emphasizes high-tech building automation systems.

Trainee \$18.00 **ISBN 0-13-109092-5**
 Instructor \$18.00 **ISBN 0-13-109115-8**

33409-03 System Commissioning and User Training (10 Hours)

Covers the basics of final testing and closeout procedures and how to build these activities into your projects. Describes customer satisfaction levels and expectations and how to meet them during the cut-over phase of any project. Focuses on industry best practices and user required training.

Trainee \$18.00 **ISBN 0-13-109093-3**
 Instructor \$18.00 **ISBN 0-13-109116-6**

33410-03 Media Management Systems (10 Hours)

Explains the basic principles behind shared media resources and their access via a computer network or hardwired application. Describes media types for both analog and digital platforms. Explores cabling options including fiber-optic interfaces.

Trainee \$18.00 **ISBN 0-13-109094-1**
 Instructor \$18.00 **ISBN 0-13-109118-2**

33411-06 Telecommunications Systems (10 Hours)

Describes the history and current use of basic subscriber systems. Also covers PBX systems used in business applications and Central office services used to interface to the public switched telephone network (PSTN).

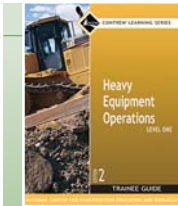
Trainee \$18.00 **ISBN 0-13-227283-0**
 Instructor \$18.00 **ISBN 0-13-227249-0**

Product Supplements	
Computerized Testing Software ISBN 0-13-109908-6	\$30
Transparency Masters ISBN 0-13-109895-0	\$25



Heavy Equipment Operations

L1 HEAVY EQUIPMENT OPERATIONS



LEVEL 1

Curriculum Notes

- Total Hours: 150 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1997 Revised: 2005, Second Edition
- Includes full-color insert

PAPERBACK

Traineer Guide: \$60 **ISBN 0-13-228197-X**
 Annotated Instructor's Guide: \$60 **ISBN: 0-13-228200-3**

MODULES

All of the modules listed below are included in the Traineer and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

22101-05 Orientation to the Trade (5 Hours)

Provides a comprehensive overview of heavy equipment uses, operator responsibilities, career opportunities, and safety principles associated with the operation of heavy equipment.

Traineer \$18.00 **ISBN 0-13-228901-6**
 Instructor \$18.00 **ISBN 0-13-228943-1**

22102-05 Heavy Equipment Safety (10 Hours)

Contains the safety guidelines for the operation, maintenance, and transportation of heavy equipment. Covers the use of signs and barricades and the safety of those working in the vicinity of heavy equipment, as well as trenching safety issues.

Traineer \$18.00 **ISBN 0-13-228902-4**
 Instructor \$18.00 **ISBN 0-13-228944-X**

22103-05 Identification of Heavy Equipment (5 Hours)

(5 Hours)

Provides an overview of each type of heavy equipment covered in the program, along with their different models, applications, and common attachments.

Traineer \$18.00 **ISBN 0-13-228938-5**
 Instructor \$18.00 **ISBN 0-13-228945-8**

22104-05 Basic Operational Techniques (25 Hours)

(25 Hours)

Provides basic instruction for the safe operation and preventive maintenance on each type of equipment, including proper mounting, startup procedures, and basic movements of the machine and its attachments. Provides the first hands-on experience with each type of machine.

Traineer \$18.00 **ISBN 0-13-228939-3**
 Instructor \$18.00 **ISBN 0-13-228946-6**

22105-05 Tractors (17.5 Hours)

Covers operation of utility tractors and heavy-duty articulated tractors as used in the construction industry. Contains detailed operation and operator maintenance instructions, including duties and responsibilities of the operator, safety rules for operation, attachment of implements, and preventive maintenance procedures performed by the operator.

Traineer \$18.00 **ISBN 0-13-228940-7**
 Instructor \$18.00 **ISBN 0-13-228947-4**

22106-05 Grades, Part One (15 Hours)

Introduces the concepts of elevations and grading, the use and interpretation of grade stakes, and the basic process of grading construction sites, distance measuring, and finish grades.

Traineer \$18.00 **ISBN 0-13-228942-3**
 Instructor \$18.00 **ISBN 0-13-228948-2**

Product Supplements

Computerized Testing Software
 ISBN 0-13-229119-3 \$30

Transparency Masters
 ISBN 0-13-229111-8 \$25

NEW! PowerPoint® Presentation Slides (in color)
 CD-ROM ISBN 0-13-229120-7 \$40

National Construction Career Test available with this title (see p. 7 for more information)

L2 HEAVY EQUIPMENT OPERATIONS

LEVEL 2

Curriculum Notes

- 167.5 Hours
- Published: 1998 Revised: 2006, Second Edition

PAPERBACK

Traineer Guide: \$88 **ISBN: 0-13-227250-4**
 Annotated Instructor's Guide: \$88 **ISBN: 0-13-227252-0**

MODULES

All of the modules listed below are included in the Traineer and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

22201-06 Introduction to Earthmoving (12.5 Hours)

(12.5 Hours)

Summarizes the earthmoving process, including the heavy equipment operator's role in ensuring an efficient and profitable operation. Explains the use of dozers, scrapers, loaders, excavators, and trucks in the earthmoving process.

Traineer \$18.00 **ISBN 0-13-228949-0**
 Instructor \$18.00 **ISBN 0-13-228959-8**

22202-06 Dump Trucks (22.5 Hours)

Covers detailed operation of on-road and off-road dump trucks used in the construction industry. Describes the duties and responsibilities of operators, safety rules, and operator preventive maintenance duties.

Traineer \$18.00 **ISBN 0-13-228950-4**
 Instructor \$18.00 **ISBN 0-13-228960-1**

22203-06 Rollers (15 Hours)

Covers operation of the various machines used to compact soil, as well as soil classifications and compaction. Describes the duties and responsibilities of operators, safety rules, and operator preventive maintenance duties.

Traineer \$18.00 **ISBN 0-13-228951-2**
 Instructor \$18.00 **ISBN 0-13-228961-X**

22204-06 Scrapers (17.5 Hours)

Describes the duties and responsibilities of operators, as well as safety rules, and operator preventive maintenance duties. Covers scraper techniques and emphasizes scraper safety.

Traineer \$18.00 **ISBN 0-13-228952-0**
 Instructor \$18.00 **ISBN 0-13-228962-8**

22205-06 Loaders (17.5 Hours)

Covers the various uses of wheel and track loaders, as well as operator maintenance, loader safety, and operating procedures. Contains procedures for using the loader in loading, grading, excavation, and demolition work.

Traineer \$18.00 **ISBN 0-13-228953-9**
 Instructor \$18.00 **ISBN 0-13-228963-6**

22206-06 Forklifts (17.5 Hours)

Covers the different types of forklifts and their applications on construction sites. Includes instructions for lifting, transporting, and placing various types of loads. Describes the duties and responsibilities of operators, as well as safety rules, and operator preventive maintenance duties.

Traineer \$18.00 **ISBN 0-13-228954-7**
 Instructor \$18.00 **ISBN 0-13-228929-6**

22207-06 Excavation Math (25 Hours)

Covers formulas and methods used to compute, cut, and fill requirements on a job, and illustrates techniques used to quickly estimate excavations. Provides a brief overview of software used to compute excavation requirements.

Traineer \$18.00 **ISBN 0-13-228955-5**
 Instructor \$18.00 **ISBN 0-13-228930-X**

22208-06 Grades, Part Two (20 Hours)

Uses information presented in previous modules to teach proper methods for setting grades, interpreting grade stakes, and reading site plans to ensure that earthmoving work meets specifications.

Traineer \$18.00 **ISBN 0-13-228956-3**
 Instructor \$18.00 **ISBN 0-13-228931-8**

Heavy Equipment Operations

22209-06 Civil Blueprint Reading (20 Hours)

Explains how to read site plans to obtain cut and fill information. Identifies safety and legal issues that are of concern for heavy equipment operators such as underground utilities and property lines.

Trainee \$18.00 **ISBN 0-13-228957-1**
 Instructor \$18.00 **ISBN 0-13-228932-6**

Product Supplements	
Computerized Testing Software ISBN 0-13-229122-3	\$30
Transparency Masters ISBN 0-13-229112-6	\$25
NEW! PowerPoint® Presentation Slides (in color) CD-ROM ISBN 0-13-229123-1	\$40

L3 HEAVY EQUIPMENT OPERATIONS

LEVEL 3

Curriculum Notes

- 203.5 Hours
- Published: 1998 Revised: 2006, Second Edition

PAPERBACK

Trainee Guide: \$88 **ISBN: 0-13-227254-7**
 Annotated
 Instructor's Guide: \$88 **ISBN: 0-13-227256-3**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

22301-06 (MT101) Introductory Skills for the Crew Leader (16 Hours)

Covers basic project planning and scheduling techniques as well as coordination and communication of work assignments to heavy equipment operators and other trades and crafts. Also describes project setup and materials purchasing requirements.

Participant Guide: \$40.00 **ISBN 0-13-103593-2**
 Instructor's Guide: \$60.00 **ISBN 0-13-103594-0**

NOTE: This module is from the Contren® Management Learning Series (see page 100 for more information). Students may be eligible to receive craft and management transcripts from NCCER's National Registry.

22302-06 Dozers (30 Hours)

Covers the uses, attachments, operating controls, maintenance requirements, transporting procedures, and operating methods for dozers, emphasizing safe operation of the equipment. Teaches dozing operations, including clearing land, backfilling, and stockpiling. Explains the use of common attachments, including winches, rippers, specialty blades, and pulled attachments.

Trainee \$18.00 **ISBN 0-13-228935-0**
 Instructor \$18.00 **ISBN 0-13-228979-2**

22303-06 Backhoes (30 Hours)

Describes backhoes and their applications, attachments, operating controls, preventive maintenance requirements, and basic operating techniques, emphasizing safe operation of the equipment. Covers trenching, loading, demolition, backfilling, laying pipe, and excavating foundations. Also covers roading and transporting the backhoe.

Trainee \$18.00 **ISBN 0-13-228936-9**
 Instructor \$18.00 **ISBN 0-13-228980-6**

22304-06 Excavators (40 Hours)

Presents information on use, safe operation, and maintenance of hydraulic excavators, including standard and telescoping excavators. Teaches basic operation of equipment and application of knowledge in performing earthwork activities, such as ditching, grading, placing riprap, and slope finishing. Describes safety issues and preventive maintenance activities.

Trainee \$18.00 **ISBN 0-13-228937-7**
 Instructor \$18.00 **ISBN 0-13-228981-4**

22305-06 Motor Graders (40 Hours)

Introduces concepts and procedures involved in the operation of motor graders. Teaches basic daily preventive maintenance, safety checking, and control of the machine. Covers main attachments used with motor graders, and the use of motor graders in performing ditching, grading, ripping, and scarifying operations.

Trainee \$18.00 **ISBN 0-13-228973-3**
 Instructor \$18.00 **ISBN 0-13-228983-0**

22306-06 Advanced Operational Techniques (20 Hours)

Presents advanced topics for equipment operators, including safety, controlling and working around water, calculating operating costs, and laying pipe. Discusses safety meetings, reporting, inspections, investigations, and hazardous material requirements. Describes the use, calibration, and maintenance of laser instruments.

Trainee \$18.00 **ISBN 0-13-228975-X**
 Instructor \$18.00 **ISBN 0-13-228984-9**

22307-06 Finishing and Grading (20 Hours)

Describes the use of various types of heavy equipment to finish and trim grades and slopes of roads, pads, ditches, and other structures; specifications used for grading; and procedures for checking the final grade. Presents soil stabilization methods and the proper use of geotextile materials for erosion control.

Trainee \$18.00 **ISBN 0-13-228976-8**
 Instructor \$18.00 **ISBN 0-13-228985-7**

22308-06 Soils (7.5 Hours)

Describes soil classification systems. Explains how shrink and swell factors affect equipment selection. Discusses how soil conditions affect equipment performance. Explains techniques for working with various soil types.

Trainee \$18.00 **ISBN 0-13-228977-6**
 Instructor \$18.00 **ISBN 0-13-228986-5**

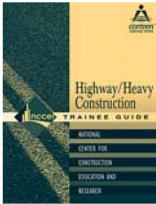
Product Supplements	
Computerized Testing Software ISBN 0-13-229124-X	\$30
Transparency Masters ISBN 0-13-229148-7	\$25
NEW! PowerPoint® Presentation Slides (in color) CD-ROM ISBN 0-13-229125-8	\$40





Highway / Heavy Construction

HIGHWAY / HEAVY CONSTRUCTION



Curriculum Notes

- Total Hours: 170 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 2001

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-061611-7**
 Annotated Instructor's Guide: \$60 **ISBN: 0-13-061612-5**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

36101-01 Introduction to the Trade (15 Hours)

Introduces the trainee to the highway/heavy construction trade, including pride, challenges, and career path. Also describes trade safety and traffic control. Identifies quality requirements for the field. Explains common tools used in the trade along with trade math and surveying basics.

Trainee \$18.00 **ISBN 0-13-064886-8**
 Instructor \$18.00 **ISBN 0-13-064896-5**

36102-01 Trucks (7.5 Hours)

Describes the types of trucks used in highway/heavy construction including rigid frame trucks, such as dump trucks and transit-mix trucks, and tractor trailer trucks. Discusses bulk haulers and flatbed trailers. Covers truck controls and components, preventive maintenance and operation, and required licensing.

Trainee \$18.00 **ISBN 0-13-064887-6**
 Instructor \$18.00 **ISBN 0-13-064897-3**

36103-01 Heavy Equipment (15 Hours)

Provides descriptions and operational procedures for many types of heavy equipment, including compaction equipment, loaders, backhoe loaders, scrapers, bulldozers, excavators, motor graders, and skid steer loaders.

Trainee \$18.00 **ISBN 0-13-064888-4**
 Instructor \$18.00 **ISBN 0-13-064898-1**

36104-01 Cranes (7.5 Hours)

Explains the types of cranes and forklifts used in highway/heavy construction. Discusses crane terminology, safety, and operations. Covers crane handbooks and records. Addresses forklift assemblies, controls, safety, operations, and maintenance.

Trainee \$18.00 **ISBN 0-13-064880-9**
 Instructor \$18.00 **ISBN 0-13-064901-5**

36105-01 Below-Grade Construction (12.5 Hours)

Discusses the below-grade construction processes that are necessary to perform highway/heavy construction. Covers excavation support systems, excavation safety, underground piping materials and fittings, joining methods for underground pipe, box culverts, and catch basins.

Trainee \$18.00 **ISBN 0-13-064891-4**
 Instructor \$18.00 **ISBN 0-13-064902-3**

36106-01 Earthmoving (12.5 Hours)

Describes the necessary procedures for preparing ground for highway/heavy construction. Explains soil basics, including terminology, identification, and classification. Addresses earthmoving operations, such as laying out slopes and grades, site excavation, and hauling, along with methods of stabilizing soils.

Trainee \$18.00 **ISBN 0-13-064892-2**
 Instructor \$18.00 **ISBN 0-13-064903-1**

36107-01 Plant Operations (7.5 Hours)

Discusses the processing and preparation of asphalt and concrete, including quarrying, crushing, screening, and testing. Explains the operation of concrete plants, hot mix asphalt plants, and pug mills.

Trainee \$18.00 **ISBN 0-13-064893-0**
 Instructor \$18.00 **ISBN 0-13-064904-X**

36108-01 Paving (7.5 Hours)

Explains how to perform hot mix asphalt paving and concrete paving. Provides descriptions for asphalt pavers and all equipment required to perform paving. Discusses concrete paving equipment such as concrete pavers, slip-form pavers, and texture/curing machines.

Trainee \$18.00 **ISBN 0-13-064894-9**
 Instructor \$18.00 **ISBN 0-13-064905-8**

36109-01 Structures (12.5 Hours)

Covers the equipment and supplies required to perform structural work. Discusses bridge types and materials, bridge substructures, and bridge superstructures. Addresses structural concrete and structural steel.

Trainee \$18.00 **ISBN 0-13-064895-7**
 Instructor \$18.00 **ISBN 0-13-064906-6**

Product Supplements

Computerized Testing Software ISBN 0-13-061848-9	\$30
Transparency Masters ISBN 0-13-061836-5	\$25



Hydroblasting



20 Hours
 Published: 2006

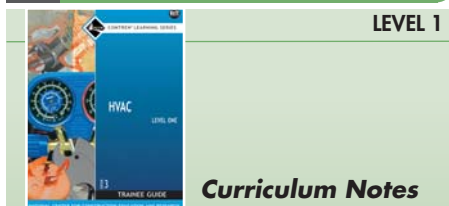
43101-06 Hydroblasting

Describes the safety procedures, basic techniques, and theory of hydroblasting, including confined spaces, manlifts, and use of pumps and waterjet equipment.

Trainee \$20.00 **ISBN 0-13-614790-9**
 Instructor \$20.00 **ISBN 0-13-614791-7**

HVAC

L1 HVAC



LEVEL 1

Curriculum Notes

- Total Hours: 175 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information)
- Published: 1995 Revised: 2007, Third Edition
- All formats including individual modules are in full-color.
- NATE Recognized Training Provider—see p. 38
- Contren Connect online is available with this title. See below for ordering information.



PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-614416-0**

Annotated Instructor's Guide: \$60 **ISBN 0-13-614418-7**



CONTREN CONNECT

Trainee Guide Paperback + Access Code Package: \$85 **ISBN 0-13-134922-8**

AIG Paperback + Access Code Package: \$160 **ISBN 0-13-134921-X**

Access Code ONLY for Trainee Guide: \$60 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605672-5**

Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605673-3**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

03101-07 Introduction to HVAC (7.5 Hours)

Covers the basic principles of heating, ventilating, and air conditioning, career opportunities in HVAC, and apprenticeship programs.

Trainee \$18.00 **ISBN 0-13-614535-3**
Instructor \$18.00 **ISBN 0-13-614547-7**

03102-07 Trade Mathematics (10 Hours)

Explains how to solve problems involving the measurement of lines, area, volume, weights, angles, pressure, vacuum, and temperature. Also introduces scientific notation, powers, roots, and basic algebra and geometry.

Trainee \$18.00 **ISBN 0-13-614536-1**
Instructor \$18.00 **ISBN 0-13-614548-5**

03103-07 Copper and Plastic Piping Practices (5 Hours)

Covers the selection, preparation, joining, and support of copper and plastic piping and fittings.

Trainee \$18.00 **ISBN 0-13-614537-X**
Instructor \$18.00 **ISBN 0-13-614549-3**

03104-07 Soldering and Brazing (7.5 Hours)

Covers tools, materials, and safety precautions and depicts step-by-step procedures for soldering and brazing piping.

Trainee \$18.00 **ISBN 0-13-614539-6**
Instructor \$18.00 **ISBN 0-13-614550-7**

03105-07 Ferrous Metal Piping Practices (5 Hours)

Covers various types of iron and steel pipe and fittings, and provides step-by-step instructions for cutting, threading, and joining ferrous piping.

Trainee \$18.00 **ISBN 0-13-614540-X**
Instructor \$18.00 **ISBN 0-13-614551-5**

03106-07 Basic Electricity (12.5 Hours)

Teaches power generation and distribution, electrical components, DC circuits, and electrical safety.

Trainee \$18.00 **ISBN 0-13-614541-8**
Instructor \$18.00 **ISBN 0-13-614553-1**

03107-07 Introduction to Cooling (30 Hours)

Covers the basic principles of heat transfer, refrigeration, and pressure-temperature relationships and describes the components and accessories used in air conditioning systems.

Trainee \$18.00 **ISBN 0-13-614543-4**
Instructor \$18.00 **ISBN 0-13-614555-8**

03108-07 Introduction to Heating (15 Hours)

Covers heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces.

Trainee \$18.00 **ISBN 0-13-614544-2**
Instructor \$18.00 **ISBN 0-13-614556-6**

03109-07 Air Distribution Systems (10 Hours)

Describes air distribution systems and their components, air flow measurement, ductwork installation principles, and the use of instruments for measuring temperature, humidity, pressure, and velocity.

Trainee \$18.00 **ISBN 0-13-614545-0**
Instructor \$18.00 **ISBN 0-13-614557-4**

Product Supplements

Computerized Testing Software ISBN 0-13-614742-9	\$30
Transparency Masters ISBN 0-13-614794-1	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-614743-7	\$40
National Construction Career Test available with this title (see p. 7 for more information)	

L2 HVAC

LEVEL 2

REVISED! Curriculum Notes

- Total Hours: 175
- Published: 1995 Revised: 2007, Third Edition
- Includes full-color insert
- NATE Recognized Training Provider—see p. 38
- Contren Connect online is available with this title. See below for ordering information.



PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-614385-7**

Annotated Instructor's Guide: \$88 **ISBN 0-13-614387-3**



CONTREN CONNECT

Trainee Guide Paperback + Access Code Package: \$113 **ISBN 0-13-134925-2**

AIG Paperback + Access Code Package: \$188 **ISBN 0-13-134923-6**

Access Code ONLY for Trainee Guide: \$88 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605677-6**

Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605678-4**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

03201-07 Commercial Airside Systems (12.5 Hours)

Describes the systems, equipment, and operating sequences used in a variety of commercial airside system configurations, such as constant volume single-zone and multi-zone, VVT, VAV, and dual-duct VAV.

Trainee \$18.00 **ISBN 0-13-614558-2**
Instructor \$18.00 **ISBN 0-13-614570-1**



HVAC

03202-07 Chimneys, Vents, and Flues (5 Hours)

Covers the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment.

Trainee \$18.00 **ISBN 0-13-614559-0**
 Instructor \$18.00 **ISBN 0-13-614571-X**

NEW! 03203-07 Introduction to Hydronic Systems (10 Hours)

Introduces hot water heating systems, focusing on safe operation of the low-pressure boilers and piping systems commonly used in residential applications.

Trainee \$18.00 **ISBN 0-13-614525-6**
 Instructor \$18.00 **ISBN 0-13-614572-8**

03204-07 Air Quality Equipment (5 Hours)

Covers the basic principles, processes, and devices used to control humidity and air clean-lines, as well as devices used to conserve energy in HVAC systems.

Trainee \$18.00 **ISBN 0-13-614526-4**
 Instructor \$18.00 **ISBN 0-13-614573-6**

03205-07 Leak Detection, Evacuation, Recovery, and Charging (20 Hours)

Covers the basic refrigerant handling and equipment servicing procedures to service HVAC systems in an environmentally safe manner.

Trainee \$18.00 **ISBN 0-13-614527-2**
 Instructor \$18.00 **ISBN 0-13-614574-4**

03206-07 Alternating Current (7.5 Hours)

Covers transformers, single-phase and three-phase power distribution, capacitors, the theory and operation of induction motors, and the instruments and techniques used in testing AC circuits and components. Also reviews electrical safety.

Trainee \$18.00 **ISBN 0-13-614528-0**
 Instructor \$18.00 **ISBN 0-13-614575-2**

03207-07 Basic Electronics (5 Hours)

Explains the theory of solid-state electronics, as well as the operation, use, and testing of the various electronic components used in HVAC equipment. Includes an introduction to computers.

Trainee \$18.00 **ISBN 0-13-614529-9**
 Instructor \$18.00 **ISBN 0-13-614576-0**

03208-07 Introduction to Control Circuit Troubleshooting (30 Hours)

Covers the operation, testing, and adjustment of conventional and electronic thermostats, as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. Also explains how to analyze circuit diagrams for electronic and microprocessor-based controls used in comfort heating and cooling equipment and how to troubleshoot systems that use these controls.

Trainee \$18.00 **ISBN 0-13-614530-2**
 Instructor \$18.00 **ISBN 0-13-614577-9**

03209-07 Troubleshooting Gas Heating (12.5 Hours)

Covers tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults.

Trainee \$18.00 **ISBN 0-13-614531-0**
 Instructor \$18.00 **ISBN 0-13-614578-7**

03210-07 Troubleshooting Cooling (20 Hours)

Covers the basic techniques and equipment used in troubleshooting cooling equipment, focusing on analyzing system temperatures and pressures in order to isolate faults.

Trainee \$18.00 **ISBN 0-13-614532-9**
 Instructor \$18.00 **ISBN 0-13-614580-9**

03211-07 Heat Pumps (20 Hours)

Covers the principles of reverse cycle heating, describes the operation of the various types of heat pumps, and describes how to analyze heat pump control circuits. Includes heat pump installation and service procedures.

Trainee \$18.00 **ISBN 0-13-614533-7**
 Instructor \$18.00 **ISBN 0-13-614581-7**

03212-07 Basic Installation and Maintenance Practices (17.5 Hours)

Covers the application and installation of various types of fasteners, gaskets, seals, and lubricants, as well as the installation and adjustment of different types of belt drives, bearings, and couplings. Includes job documentation and customer relations.

Trainee \$18.00 **ISBN 0-13-614569-8**
 Instructor \$18.00 **ISBN 0-13-614582-5**

NEW! 03213-07 Sheet Metal Duct Systems (5 Hours)

Covers layout, fabrication, installation, and insulating sheet metal ductwork. Also includes selection and installation of registers, diffusers, dampers, and other duct accessories.

Trainee \$18.00 **ISBN 0-13-604589-8**
 Instructor \$18.00 **ISBN 0-13-604591-X**

NEW! 03214-07 Fiberglass and Flexible Duct Systems (5 Hours)

Covers the layout, fabrication, installation, and joining of fiberglass ductwork and fittings. Describes the proper methods for attaching and supporting flex duct.

Trainee \$18.00 **ISBN 0-13-604590-1**
 Instructor \$18.00 **ISBN 0-13-604592-8**

Product Supplements	
Computerized Testing Software ISBN 0-13-614779-8	\$30
Transparency Masters ISBN 0-13-614795-X	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-602591-9 (planned Summer 2008)	\$40

L3 HVAC

REVISÉD! **LEVEL 3**

Curriculum Notes

- Total Hours: 145
- Published: 1996 To Be Revised: Summer 2008, Third Edition
- NATE Recognized Training Provider—see p. 38
- Contren Connect online is available with this title. See below for ordering information.



PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-604492-1**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-604493-X**



CONTREN CONNECT

Trainee Guide Paperback
 + Access Code Package: \$113 **ISBN 0-13-814338-2**
 AIG Paperback
 + Access Code Package: \$188 **ISBN 0-13-814337-4**
 Access Code ONLY for Trainee Guide: \$88
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605716-0**
 Access Code ONLY for AIG: \$100
 (must be ordered electronically via OASIS;
 does not include print book) **ISBN 0-13-605717-9**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

NEW! 03301-08 Refrigerants and Oils (10 Hours)

Covers characteristics and applications of the current generation of refrigerants, including both pure and blended refrigerants. Also provides extensive coverage of lubricating oils used in refrigeration systems.

Trainee \$18.00 **ISBN 0-13-604593-6**
 Instructor \$18.00 **ISBN 0-13-604642-8**

HVAC

L4 HVAC

LEVEL 4

Curriculum Notes

- 147.5 Hours
- Published: 1996 Revised: 2003
- NATE Recognized Training Provider—see p. 38
- Contren Connect online is available with this title. See below for ordering information.
- A revision is under way and due in stock December 2008. Ordering information for the Trainee Guide and Annotated Instructor's Guide follows the Product Supplements box.



PAPERBACK

Trainee Guide: \$88 ISBN 0-13-102612-7
 Annotated Instructor's Guide: \$88 ISBN 0-13-102614-3

BINDER

Trainee Guide: \$93 ISBN 0-13-102613-5
 Annotated Instructor's Guide: \$93 ISBN 0-13-102615-1



CONTREN CONNECT

Trainee Guide Paperback + Access Code Package: \$113 ISBN 0-13-243470-9
 AIG Paperback + Access Code Package: \$188 ISBN 0-13-243471-7
 Access Code ONLY for Trainee Guide: \$88 (must be ordered electronically via OASIS; does not include print book) ISBN 0-13-605721-7
 Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) ISBN 0-13-605722-5

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

03401-03 Construction Drawings and Specifications (25 Hours)

Discusses techniques for reading and using blueprints, specifications, and shop drawings. Refers to blueprints from the Core Curriculum.
 Trainee \$18.00 ISBN 0-13-867987-8
 Instructor \$18.00 ISBN 0-13-867995-9

03402-03 Indoor Air Quality (15 Hours)

Introduces indoor air quality and its effect on the health and comfort of building occupants. Provides guidelines for performing a building IAQ survey and identifies equipment and methods used to test for and achieve good indoor air quality.
 Trainee \$18.00 ISBN 0-13-868001-9
 Instructor \$18.00 ISBN 0-13-868019-1

03302-08 Compressors (15 Hours)

Explains the operating principles of the different types of compressors used in comfort air conditioning and refrigeration systems, along with basic installation, service, and repair procedures for these compressors.

Trainee \$18.00 ISBN 0-13-604630-4
 Instructor \$18.00 ISBN 0-13-604643-6

03303-08 Metering Devices (7.5 Hours)

Covers the operating principles, applications, installation, and adjustment of the various types of fixed and adjustable expansion devices used in air conditioning equipment.

Trainee \$18.00 ISBN 0-13-604631-2
 Instructor \$18.00 ISBN 0-13-604644-4

NEW! 03304-08 Retail Refrigeration Systems (20 Hours)

Introduces the product refrigeration components and systems, such as the reach-in coolers and freezers commonly used in markets.

Trainee \$18.00 ISBN 0-13-604632-0
 Instructor \$18.00 ISBN 0-13-604646-0

NEW! 03305-08 Commercial Hydronic Systems (12.5 Hours)

Covers the various types of boilers, components, and piping systems used in commercial heating applications. Also introduces chilled water systems and their components.

Trainee \$18.00 ISBN 0-13-604633-9
 Instructor \$18.00 ISBN 0-13-604647-9

NEW! 03306-08 Steam Systems (10 Hours)

Covers operating principles, piping systems, components, and preventive maintenance requirements of steam systems and steam traps.

Trainee \$18.00 ISBN 0-13-604634-7
 Instructor \$18.00 ISBN 0-13-604648-7

03307-08 Planned Maintenance (20 Hours)

Describes the purpose of planned maintenance and outlines the procedures for servicing gas and oil furnaces, electric heating equipment, cooling equipment, and heat pumps.

Trainee \$18.00 ISBN 0-13-604635-5
 Instructor \$18.00 ISBN 0-13-604649-5

03308-08 Water Treatment (10 Hours)

Covers the kinds of water problems encountered in heating and cooling systems and identifies various water treatment methods and equipment.

Trainee \$18.00 ISBN 0-13-604636-3
 Instructor \$18.00 ISBN 0-13-604650-9

03309-08 Troubleshooting Electronic Controls (7.5 Hours)

Explains how to analyze circuit diagrams for electronic and microprocessor-based controls used in comfort heating and cooling equipment and how to troubleshoot systems that use these controls.

Trainee \$18.00 ISBN 0-13-604638-X
 Instructor \$18.00 ISBN 0-13-604651-7

03310-08 Troubleshooting Oil Heating (10 Hours)

Covers how to identify the common causes of problems in oil furnaces and offers hands-on experience in isolating and correcting oil furnace malfunctions.

Trainee \$18.00 ISBN 0-13-604639-8
 Instructor \$18.00 ISBN 0-13-604652-5

03311-08 Troubleshooting Heat Pumps (12.5 Hours)

Reviews heat pump operation and heat pump control circuits, including how to isolate and correct faults in the heating, cooling, auxiliary heat, and defrost functions of heat pumps.

Trainee \$18.00 ISBN 0-13-604640-1
 Instructor \$18.00 ISBN 0-13-604654-1

03312-08 Troubleshooting Accessories (10 Hours)

Provides hands-on lab sessions on how to troubleshoot humidifiers, electronic air cleaners, economizers, zone controls, and heat recovery ventilators.

Trainee \$18.00 ISBN 0-13-604641-X
 Instructor \$18.00 ISBN 0-13-604620-7

Product Supplements

Computerized Testing Software ISBN 0-13-605578-8	\$30
Transparency Masters ISBN 0-13-605565-6	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-605579-6 (planned Fall 2008)	\$40

Ordering information for the 2002 edition:

To order before July 1, 2008 use the following ISBNs or visit the online catalog at www.nccer.org

PAPERBACK

Trainee Guide: \$88 ISBN 0-13-047219-0
 Annotated Instructor's Guide: \$88 ISBN 0-13-047221-2



HVAC

03403-03 Energy Conservation Equipment (10 Hours)

Introduces the trainees to various heat recovery/reclaim devices and other energy reduction and recovery apparatus.

Trainee \$18.00 **ISBN 0-13-868027-2**
Instructor \$18.00 **ISBN 0-13-868035-3**

03404-03 Building Management Systems (17.5 Hours)

Explains how computers and microprocessor controls are used to manage zoned HVAC systems in residential and commercial buildings.

Trainee \$18.00 **ISBN 0-13-868068-X**
Instructor \$18.00 **ISBN 0-13-868076-0**

03405-03 Water Treatment (10 Hours)

Covers the kinds of water problems encountered in heating and cooling systems and identifies various water treatment methods and equipment.

Trainee \$18.00 **ISBN 0-13-868084-1**
Instructor \$18.00 **ISBN 0-13-868092-2**

03406-03 System Startup and Shutdown (22.5 Hours)

Covers procedures for the startup of hot water and steam heating systems, chilled water systems, and forced air distribution systems. Emphasis is on startup after initial equipment installation or after an extended period of shutdown. Includes procedures to prepare the same kinds of systems for extended periods of shutdown.

Trainee \$18.00 **ISBN 0-13-868100-7**
Instructor \$18.00 **ISBN 0-13-868118-X**

03407-03 Heating and Cooling System Design (25 Hours)

Explains the factors that affect the heating and cooling loads of a building, describes the process by which the heating and cooling loads are calculated, and shows how load information is used to select heating and cooling equipment. Covers types of duct systems and their selection, sizing, and installation.

Trainee \$18.00 **ISBN 0-13-868126-0**
Instructor \$18.00 **ISBN 0-13-868134-1**

03408-03 Commercial and Industrial Refrigeration (22.5 Hours)

Covers components and operation of refrigeration systems, with emphasis on systems used in cold storage and other commercial food preservation applications. Also covers the components and operation of ice making machines.

Trainee \$18.00 **ISBN 0-13-868142-2**
Instructor \$18.00 **ISBN 0-13-868159-7**

Product Supplements

Computerized Testing Software ISBN 0-13-103321-2	\$30
Transparency Masters ISBN 0-13-103332-8	\$25

Ordering Information for 2008 revision due December 2008:

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-604494-8**
Annotated
Instructor's Guide: \$88 **ISBN 0-13-604495-6**

NATE CERTIFICATION



NCCER is an officially recognized training provider for North American Technician Excellence (NATE), an independent, third-party certification body for HVAC/R technicians. NATE-certified technicians can use selected HVAC and Sheet Metal module completions through NCCER-accredited training providers for recertification through NATE. For example, the HVAC module 03402-03 "Indoor Air Quality" counts as 10 hours toward the 60 hours of continuing education required within five years of the technician's certification. For details and lists of available NATE-recognized training, visit www.natex.org. For more information regarding NATE recertification, please contact NCCER Customer Service.

Industrial Coatings

NCCER and NACE International, two leading providers of industry education, training, and certification, have joined forces to deliver a comprehensive industrial coating applicator training and certification program. The NCCER/NACE Industrial Coating Applicator Training and Certification Program follows the joint NACE/SSPC standard for Industrial Coating and Lining Application Specialist Qualifications.

Level 1 of the program released in late 2007 and Level 2 is planned for summer of 2008. Two additional levels are also planned. Please contact NCCER's Customer Service department at 1-888-622-3720 or your regional Pearson Contren sales specialist for more information.

Product Supplements	
Computerized Testing Software ISBN 0-13-605586-9	\$30
Transparency Masters ISBN 0-13-605572-9	\$25

L2 INDUSTRIAL COATING AND LINING APPLICATION SPECIALIST

NEW! **LEVEL 2**

Curriculum Notes

- Total Hours: Not determined as of press time
- To Be Published: Summer 2008
- Modular contents accurate as of press time, but subject to change pending final validation by Subject Matter Experts.

PAPERBACK

Trainee Guide: \$100	ISBN 0-13-604510-3
Annotated Instructor's Guide: \$100	ISBN 0-13-604511-1

L1 INDUSTRIAL COATING AND LINING APPLICATION SPECIALIST

NEW! **LEVEL 1**

Curriculum Notes

- Total Hours: 230 (includes 50 hours from the Core Curriculum)
- Published: 2007
- A Spanish translation of the Trainee Guide and tests is planned for summer 2008. Visit the online catalog at www.nccer.org for ordering information once published.

PAPERBACK

Trainee Guide: \$100	ISBN 0-13-604508-1
Annotated Instructor's Guide: \$100	ISBN 0-13-604509-X

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

00101-04 Basic Safety (15 Hours)

Explains the safety obligations of workers, supervisors, and managers to ensure a safe workplace. Discusses the causes and results of accidents and the dangers of rationalizing risk. Reviews the role of company policies and OSHA regulations. Introduces common job-site hazards and protections.

Trainee \$18.00	ISBN 0-13-160004-4
Instructor \$18.00	ISBN 0-13-160013-3

00102-04 Introduction to Construction Math (15 Hours)

Reviews basic mathematical functions such as adding, subtracting, dividing, and multiplying whole numbers, fractions, and decimals, and explains their applications to the construction trades. Explains decimal-fraction conversions and the metric system using practical examples. Also reviews basic geometry as applied to common shapes and forms.

Trainee \$18.00	ISBN 0-13-160005-2
Instructor \$18.00	ISBN 0-13-160014-1

00106-04 Basic Rigging (20 Hours)

Explains how ropes, chains, hoists, loaders, and cranes are used to move material and equipment from one location to another on a job site. Describes inspection techniques and load-handling safety practices. Also reviews American National Standards Institute (ANSI) hand signals.

Trainee \$18.00	ISBN 0-13-160009-5
Instructor \$18.00	ISBN 0-13-160018-4

69101-07 Introduction to the Trade (5 hours)

Provides an introduction to the coatings industry, career opportunities, and includes an introduction to coatings safety.

Trainee \$18.00	ISBN 0-13-604816-1
Instructor \$18.00	ISBN 0-13-604822-6

69102-07 Containment and Ventilation (20 hours)

Covers basic issues and reasons for containment and ventilation, including confined space problems, air exchange, and types of containment.

Trainee \$18.00	ISBN 0-13-604817-X
Instructor \$18.00	ISBN 0-13-604823-4

69103-07 Surface Preparation (80 hours)

Covers reasons for surface preparation, standards of preparation, and methods of preparing surfaces, including use of basic equipment, as well as cleaning procedures.

Trainee \$18.00	ISBN 0-13-604818-8
Instructor \$18.00	ISBN 0-13-604824-2

69104-07 Industrial Coatings (15 hours)

Covers types of coatings, advantages and disadvantages, applications, and specific preparations required.

Trainee \$18.00	ISBN 0-13-604820-X
Instructor \$18.00	ISBN 0-13-604825-0

69105-07 Coating Applications I (60 hours)

Covers application of various coatings, including equipment setup, mixing, and preparation of coatings.

Trainee \$18.00	ISBN 0-13-604821-8
Instructor \$18.00	ISBN 0-13-604826-9

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

69201-08 Industrial Coating Safety

Describes safety standards and regulations, access control, and personal safety equipment and training requirements. Covers safety decision-making procedures.

Trainee \$18.00	ISBN 0-13-604827-7
Instructor \$18.00	ISBN 0-13-604800-5

69202-08 Corrosion Protection

Teaches the elements of corrosion in concrete and metals and chemistry of corrosion.

Trainee \$18.00	ISBN 0-13-604828-5
Instructor \$18.00	ISBN 0-13-604801-3

69203-08 Containment II

Provides training and practice in the containment appropriate to various coating and surface preparation applications, including standards and verification as well as containment erection.

Trainee \$18.00	ISBN 0-13-604795-5
Instructor \$18.00	ISBN 0-13-604803-X

69204-08 Work Planning and Quality Control

Covers calculating volume, area, ratios, and how to determine VOC ratios to thinner addition. Explains relationship of pressure, volume and temperature to surface preparation and to application. Explains how to read and execute a work plan.

Trainee \$18.00	ISBN 0-13-604796-3
Instructor \$18.00	ISBN 0-13-604839-0



Industrial Coatings

69205-08 Surface Preparation II

Provides specific training and application of surface preparation equipment and procedures. Describes measuring and documentation processes. Also covers troubleshooting equipment.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-604797-1
ISBN 0-13-604840-4

69206-08 Industrial Coatings II

Covers chemistry and types of coatings, including convertible and non-convertible coatings.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-604798-X
ISBN 0-13-604841-2

69207-08 Coating Applications II

Covers documentation of applications, setup, maintenance and disassembly of conventional, airless, air/airless, and HVLP spraying equipment, testing and documentation both before and after application, and overcoating.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-604799-8
ISBN 0-13-604842-0

Product Supplements

Computerized Testing Software ISBN 0-13-605587-7	\$30
Transparency Masters ISBN 0-13-605573-7	\$25

Industrial Maintenance

The much anticipated revision to Industrial Maintenance Levels 1-5 is now underway. In response to our customers representing petrochemical, power generation, and pulp and paper plants, NCCER's Industrial Maintenance program is being divided into two distinct disciplines: Industrial Maintenance Electrical & Instrumentation Technician and Industrial Maintenance Mechanic.

LI INDUSTRIAL MAINTENANCE ELECTRICAL & INSTRUMENTATION TECHNICIAN

LEVEL 1



Curriculum Notes

- Total Hours: 195 hours (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information)
- Published: 1998 Revised: 2007, Third Edition
- Includes five new modules!

PAPERBACK

Trainee Guide: \$60 ISBN 0-13-228606-8
Annotated Instructor's Guide: \$60 ISBN 0-13-228607-6

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

40101-07 Orientation to the Trade (2.5 Hours)

Covers the history of the trade, and the kinds of work and work environments industrial maintenance craftspeople would find in the field. Describes the apprenticeship and training programs available, as well as the career opportunities in industrial maintenance. The responsibilities and characteristics a worker should possess are also described.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-614612-0
ISBN 0-13-614625-2

40102-07 Tools of the Trade (5 Hours)

Provides an introduction to the hand and power tools used in industrial maintenance. Covers safety procedures and techniques for use of these tools.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-614613-9
ISBN 0-13-614626-0

40103-07 Fasteners and Anchors (5 Hours)

Covers the hardware and systems used by an industrial maintenance craftsperson. Describes various types of anchors and supports, their applications, and how to install them safely.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-614614-7
ISBN 0-13-614627-9

40104-07 Oxyfuel Cutting (17.5 Hours)

Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and provides instructions for setting up, lighting, and using the equipment. Includes straight line cutting, piercing, beveling, washing, and gouging.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-614615-5
ISBN 0-13-614628-7

40105-07 Gaskets and Packing (10 Hours)

Introduces types of gaskets and gasket material, types of packing and packing material, and types of O-ring material. Explains the use of gaskets, packing, and O-rings, and teaches how to fabricate a gasket.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-614616-3
ISBN 0-13-614596-5

40106-07 Craft-Related Mathematics (15 Hours)

Explains how to use ratios and proportions, solve basic algebra, area, volume, and circumference problems, and solve for right triangles using the Pythagorean theorem.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-614617-1
ISBN 0-13-614597-3

40107-07 Construction Drawings (12.5 Hours)

Introduces plot plans, structural drawings, elevation drawings, as-built drawings, equipment arrangement drawings, P&IDs, isometric drawings, basic circuit diagrams, and detail sheets.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-614618-X
ISBN 0-13-614598-1

40108-07 Pumps and Drivers (5 Hours)

Explains centrifugal, rotary, reciprocating, metering, and vacuum pump operation and installation methods, as well as types of drivers. Also covers net positive suction head and cavitation.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-614619-8
ISBN 0-13-614599-X

40109-07 Valves (5 Hours)

Identifies and provides installation methods for different types of valves. Also covers valve storage and handling.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-614620-1
ISBN 0-13-614600-7

40110-07 Introduction to Test Instruments (7.5 Hours)

Introduces the basic test equipment for industrial maintenance, including tachometers, pyrometers, strobe meters, voltage testers, and automated diagnostic tools.

Trainee \$18.00
Instructor \$18.00

ISBN 0-13-614621-X
ISBN 0-13-614601-5

Industrial Maintenance

40111-07 Material Handling and Hand Rigging (15 Hours)

Introduces the equipment and techniques of material handling, and describes the procedures for rigging and communicating with riggers.

Trainee \$18.00 **ISBN 0-13-614622-8**
 Instructor \$18.00 **ISBN 0-13-614602-3**

40112-07 Mobile and Support Equipment (10 Hours)

Introduces the safety procedures and methods of operation for motorized support equipment, including forklifts, manlifts, compressors, and generators.

Trainee \$18.00 **ISBN 0-13-614623-6**
 Instructor \$18.00 **ISBN 0-13-614639-2**

40113-07 Lubrication (12.5 Hours)

Explains lubrication safety, storage, and classifications. Also explains selecting lubricants, additives, lubrication equipment, and lubricating charts.

Trainee \$18.00 **ISBN 0-13-614624-4**
 Instructor \$18.00 **ISBN 0-13-614640-6**

Product Supplements	
Computerized Testing Software ISBN 0-13-614938-3	\$30
Transparency Masters ISBN 0-13-614939-1	\$25
NEW! PowerPoint® Presentation Slides (in color) (planned for Fall 2008: visit www.nccer.org for ISBN)	

L2 INDUSTRIAL MAINTENANCE ELECTRICAL & INSTRUMENTATION TECHNICIAN

REVISED! LEVEL 2 Curriculum Notes

- Total Hours: 152.5
- Published: 1998 To Be Revised: Summer 2008, Third Edition

PAPERBACK	
Trainee Guide: \$88	ISBN 0-13-614390-3
Annotated Instructor's Guide: \$88	ISBN 0-13-614391-1

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

40201-08 Industrial Safety for E & I Technicians (12.5 Hours)

Covers safety rules and regulations for electrical workers, the necessary precautions to take for various electrical hazards found on the job, and the OSHA-mandated lockout/tagout procedure.

Trainee \$18.00 **ISBN 0-13-604701-7**
 Instructor \$18.00 **ISBN 0-13-604716-5**

40202-08 Introduction to the National Electrical Code (2.5 Hours)

Provides a navigational road map for using the NEC®. Introduces the layout of the NEC® and the types of information found within the code book. Allows trainees to practice finding information using an easy-to-follow procedure.

Trainee \$18.00 **ISBN 0-13-604702-5**
 Instructor \$18.00 **ISBN 0-13-604717-3**

40203-08 Electrical Theory (15 Hours)

Offers a general introduction to the electrical concepts used in Ohm's law as applied to DC series circuits. Includes atomic theory, electromotive force, resistance, and electric power equations. Introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchoff's voltage and current laws, and circuit analysis.

Trainee \$18.00 **ISBN 0-13-604704-1**
 Instructor \$18.00 **ISBN 0-13-604718-1**

40204-08 Alternating Current (17.5 Hours)

Covers transformers, single-phase and three-phase power distribution, capacitors, the theory and operation of induction motors, and the instruments and techniques used in testing AC circuits and components.

Trainee \$18.00 **ISBN 0-13-604705-X**
 Instructor \$18.00 **ISBN 0-13-604719-X**

NEW! 40205-08 E & I Test Equipment (7.5 Hours)

Focuses on proper selection, inspection, and use of common electrical and instrumentation test equipment, including voltage testers, clamp-on ammeters, ohmmeters, multimeters, phase/motor rotation testers, data recording equipment, field communicators, pressure testers, and dead weight testers. Also covers safety precautions and meter category ratings.

Trainee \$18.00 **ISBN 0-13-604706-8**
 Instructor \$18.00 **ISBN 0-13-604720-3**

40206-08 Flow, Pressure, Level, and Temperature (17.5 Hours)

Presents devices used to measure flow, pressure, level, and temperature, along with their principles of operation.

Trainee \$18.00 **ISBN 0-13-604707-6**
 Instructor \$18.00 **ISBN 0-13-604721-1**

40207-08 Process Mathematics (15 Hours)

Covers measurement of mass, weight, pressure, temperature, and flow, conversion of units, and their application to instrumentation.

Trainee \$18.00 **ISBN 0-13-604708-4**
 Instructor \$18.00 **ISBN 0-13-604722-X**

40208-08 Hand Bending of Conduit (10 Hours)

Provides an introduction to conduit bending and installation. Covers the techniques for using hand-operated and step conduit benders, as well as cutting, reaming, and threading conduit.

Trainee \$18.00 **ISBN 0-13-604709-2**
 Instructor \$18.00 **ISBN 0-13-604723-8**

40209-08 Tubing (12.5 Hours)

Introduces a variety of tubing, tubing materials, tools, and work practices. Covers proper storage and handling, cutting, deburring, reaming, bending, and flaring of tubing.

Trainee \$18.00 **ISBN 0-13-604710-6**
 Instructor \$18.00 **ISBN 0-13-604724-6**

40210-08 Clean, Purge, and Test Tubing and Piping Systems (10 Hours)

Presents safe methods for cleaning, purging, blowing down, pressure testing, and leak testing tubing, piping, and hoses used in instrumentation.

Trainee \$18.00 **ISBN 0-13-604711-4**
 Instructor \$18.00 **ISBN 0-13-604690-8**

40211-08 Instrument Drawings and Documents, Part 1 (10 Hours)

Introduces instrument symbols, abbreviations, and specific types of drawings and documents, including instrument indexes, installation detail drawings, location drawings, and control loops.

Trainee \$18.00 **ISBN 0-13-604713-0**
 Instructor \$18.00 **ISBN 0-13-604691-6**

40212-08 Conductors and Cables (15 Hours)

Focuses on the types and applications of conductors and electrical cabling and covers proper wiring techniques. Stresses the applicable NEC® requirements.

Trainee \$18.00 **ISBN 0-13-604714-9**
 Instructor \$18.00 **ISBN 0-13-604692-4**

40213-08 Conductor Terminations and Splices (7.5 Hours)

Describes methods of terminating and splicing conductors of all types and sizes, including preparing and taping conductors.

Trainee \$18.00 **ISBN 0-13-604715-7**
 Instructor \$18.00 **ISBN 0-13-604693-2**



Industrial Maintenance

Product Supplements

Computerized Testing Software ISBN 0-13-614780-1	\$30
Transparency Masters ISBN 0-13-614796-8	\$25
NEW! PowerPoint® Presentation Slides (in color) (planned for Fall 2008: visit www.nccer.org for ISBN)	

L3 INDUSTRIAL MAINTENANCE ELECTRICAL & INSTRUMENTATION TECHNICIAN

REVISED!

LEVEL 3

Curriculum Notes

- Total Hours: 212.5
- Published: 1998 To Be Revised: December 2008, Third Edition

PAPERBACK

Trainee Guide: \$88	ISBN 0-13-604499-9
Annotated Instructor's Guide: \$88	ISBN 0-13-604500-6

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

40301-08 Hazardous Locations (15 Hours)

Covers all classes of hazardous locations, including seals, components, and equipment approved for use in various hazardous locations.

Trainee \$18.00	ISBN 0-13-604694-0
Instructor \$18.00	ISBN 0-13-604744-0

40302-08 Electronic Components (10 Hours)

Introduces the principles of electronics and semiconductor theory, components, and applications.

Trainee \$18.00	ISBN 0-13-604696-7
Instructor \$18.00	ISBN 0-13-604746-7

40303-08 E & I Drawings (10 Hours)

Covers reading and interpreting of piping and instrumentation drawings, loop sheets, flow diagrams, isometrics, and orthographics, enabling trainees to identify types of instrumentation and the specifications for installation.

Trainee \$18.00	ISBN 0-13-604697-5
Instructor \$18.00	ISBN 0-13-604747-5

40304-08 Motor Controls (20 Hours)

Provides information on selecting, sizing, and installing motor controllers. Also covers control circuit pilot devices and basic relay logic.

Trainee \$18.00	ISBN 0-13-604698-3
Instructor \$18.00	ISBN 0-13-604748-3

40305-08 Distribution Equipment (12.5 Hours)

Explains distribution equipment, including grounding, switchboard and ground fault maintenance, transformers, and electrical drawing identification.

Trainee \$18.00	ISBN 0-13-604734-3
Instructor \$18.00	ISBN 0-13-604749-1

40306-08 Transformers (15 Hours)

Discusses transformer types, construction, connections, protection, and grounding along with capacitors and rectifiers.

Trainee \$18.00	ISBN 0-13-604735-1
Instructor \$18.00	ISBN 0-13-604750-5

40307-08 Conductor Selection and Calculation (15 Hours)

Covers the types of conductors used in wiring systems, including insulation, current-carrying capacity, and temperature ratings.

Trainee \$18.00	ISBN 0-13-604736-X
Instructor \$18.00	ISBN 0-13-604751-3

NEW! 40308-08 Temporary Grounding (10 Hours)

Covers the methods used to eliminate or reduce electrical shock hazards to personnel working on electrical equipment.

Trainee \$18.00	ISBN 0-13-604738-6
Instructor \$18.00	ISBN 0-13-604753-X

40309-08 Commercial and Industrial Electrical Services (10 Hours)

Covers methods and techniques for both single-phase and three-phase services, including metering equipment and NEC® regulations.

Trainee \$18.00	ISBN 0-13-604739-4
Instructor \$18.00	ISBN 0-13-604754-8

40310-08 Pipe Layout and Installation (45 Hours)

Introduces piping and tubing layout procedures. Explains the steps in creating a hand-sketched isometric drawing that can be applied in the piping and tubing installation. Introduces methods and procedures used to measure, cut, bend, and support piping and tubing.

Trainee \$18.00	ISBN 0-13-604740-8
Instructor \$18.00	ISBN 0-13-604755-6

40311-08 Machine Bending of Conduit (15 Hours)

Covers all types of bends in all sizes of conduit up to six inches. Focuses on mechanical, hydraulic, and electrical benders.

Trainee \$18.00	ISBN 0-13-604741-6
Instructor \$18.00	ISBN 0-13-604756-4

40312-08 Hydraulic and Pneumatic Controls (25 Hours)

Explains the basic principles of hydraulic and pneumatic systems and the components used in these systems, along with related safety concerns.

Trainee \$18.00	ISBN 0-13-604742-4
Instructor \$18.00	ISBN 0-13-604757-2

NEW! 40313-08 Motor-Operated Valves (10 Hours)

Covers motor-driven valves, ranging from the small, servo-mechanical actuators to the very large valves that could only be operated by several people if they were not motor driven. Includes electrical, pneumatic, and hydraulic operators.

Trainee \$18.00	ISBN 0-13-604743-2
Instructor \$18.00	ISBN 0-13-604758-0

Product Supplements

Computerized Testing Software ISBN 0-13-605583-4	\$30
Transparency Masters ISBN 0-13-605570-2	\$25

Ordering information for Industrial Maintenance Level 3, 2000 edition:

Visit the online catalog at www.nccer.org to view the modular contents.

PAPERBACK

Trainee Guide: \$88	ISBN 0-13-012583-0
Annotated Instructor's Guide: \$88	ISBN 0-13-012585-7

L1 INDUSTRIAL MAINTENANCE MECHANIC

LEVEL 1



Curriculum Notes

- Total Hours: 195 hours (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information)
- Published: 1998 Revised: 2007, Third Edition
- Includes five new modules!

PAPERBACK

Trainee Guide: \$60	ISBN 0-13-228608-4
Annotated Instructor's Guide: \$60	ISBN 0-13-228609-2

Industrial Maintenance

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

32101-07 Orientation to the Trade (2.5 Hours)

Covers the history of the trade, and the kinds of work and work environments industrial maintenance craftspeople would find in the field. Describes the apprenticeship and training programs available, as well as the career opportunities in industrial maintenance. The responsibilities and characteristics a worker should possess are also described.

Trainee \$18.00 **ISBN 0-13-614583-3**
 Instructor \$18.00 **ISBN 0-13-614563-9**

32102-07 Tools of the Trade (5 Hours)

Provides an introduction to the hand and power tools used in industrial maintenance. Covers safety procedures and techniques for use of these tools.

Trainee \$18.00 **ISBN 0-13-614584-1**
 Instructor \$18.00 **ISBN 0-13-614564-7**

32103-07 Fasteners and Anchors (5 Hours)

Covers the hardware and systems used by an industrial maintenance craftsperson. Describes various types of anchors and supports, their applications, and how to install them safely.

Trainee \$18.00 **ISBN 0-13-614585-X**
 Instructor \$18.00 **ISBN 0-13-614565-5**

32104-07 Oxyfuel Cutting (17.5 Hours)

Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and provides instructions for setting up, lighting, and using the equipment. Includes straight line cutting, piercing, beveling, washing, and gouging.

Trainee \$18.00 **ISBN 0-13-614586-8**
 Instructor \$18.00 **ISBN 0-13-614566-3**

32105-07 Gaskets and Packing (10 Hours)

Introduces types of gaskets and gasket material, types of packing and packing material, and types of O-ring material. Explains the use of gaskets, packing, and O-rings, and teaches how to fabricate a gasket.

Trainee \$18.00 **ISBN 0-13-614588-4**
 Instructor \$18.00 **ISBN 0-13-614567-1**

32106-07 Craft-Related Mathematics (15 Hours)

Explains how to use ratios and proportions, solve basic algebra, area, volume, and circumference problems, and solve for right triangles using the Pythagorean theorem.

Trainee \$18.00 **ISBN 0-13-614589-2**
 Instructor \$18.00 **ISBN 0-13-614568-X**

32107-07 Construction Drawings (12.5 Hours)

Introduces plot plans, structural drawings, elevation drawings, as-built drawings, equipment arrangement drawings, P&IDs, isometric drawings, basic circuit diagrams, and detail sheets.

Trainee \$18.00 **ISBN 0-13-614590-6**
 Instructor \$18.00 **ISBN 0-13-614604-X**

32108-07 Pumps and Drivers (5 Hours)

Explains centrifugal, rotary, reciprocating, metering, and vacuum pump operation and installation methods, as well as types of drivers. Also covers net positive suction head and cavitation.

Trainee \$18.00 **ISBN 0-13-614591-4**
 Instructor \$18.00 **ISBN 0-13-614605-8**

32109-07 Valves (5 Hours)

Identifies and provides installation methods for different types of valves. Also covers valve storage and handling.

Trainee \$18.00 **ISBN 0-13-614592-2**
 Instructor \$18.00 **ISBN 0-13-614606-6**

32110-07 Introduction to Test Instruments (7.5 Hours)

Introduces the basic test equipment for industrial maintenance, including tachometers, pyrometers, strobe meters, voltage testers, and automated diagnostic tools.

Trainee \$18.00 **ISBN 0-13-614593-0**
 Instructor \$18.00 **ISBN 0-13-614607-4**

32111-07 Material Handling and Hand Rigging (15 Hours)

Introduces the equipment and techniques of material handling, and describes the procedures for rigging and communicating with riggers.

Trainee \$18.00 **ISBN 0-13-614594-9**
 Instructor \$18.00 **ISBN 0-13-614608-2**

32112-07 Mobile and Support Equipment (10 Hours)

Introduces the safety procedures and methods of operation for motorized support equipment, including forklifts, manlifts, compressors, and generators.

Trainee \$18.00 **ISBN 0-13-614560-4**
 Instructor \$18.00 **ISBN 0-13-614609-0**

32113-07 Lubrication (12.5 Hours)

Explains lubrication safety, storage, and classifications. Also explains selecting lubricants, additives, lubrication equipment, and lubricating charts.

Trainee \$18.00 **ISBN 0-13-614562-0**
 Instructor \$18.00 **ISBN 0-13-614611-2**

Product Supplements	
Computerized Testing Software ISBN 0-13-229107-X	\$30
Transparency Masters ISBN 0-13-229160-6	\$25
NEW! PowerPoint® Presentation Slides (in color) (planned for Fall 2008: visit www.nccer.org for ISBN)	

L2 INDUSTRIAL MAINTENANCE MECHANIC

LEVEL 2

REVISED!

Curriculum Notes

- Total Hours: 160
- Published: 1998 Revised: 2007, Third Edition
- Includes seven new modules.

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-614392-X**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-614393-8**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

NEW! 32201-07 Basic Layout (20 Hours)

Discusses the tools used in layout. Explains how to lay out baselines using the arc method and 3-4-5 method.

Trainee \$18.00 **ISBN 0-13-604621-5**
 Instructor \$18.00 **ISBN 0-13-604668-1**

NEW! 32202-07 Introduction to Piping Components (5 Hours)

Introduces chemical, compressed air, fuel oil, steam, and water systems. Explains how to identify piping systems according to color codes.

Trainee \$18.00 **ISBN 0-13-604622-3**
 Instructor \$18.00 **ISBN 0-13-604669-X**

32203-07 Copper and Plastic Piping Practices (5 Hours)

Covers the selection, preparation, joining, and support of copper, plastic piping, and fittings.

Trainee \$18.00 **ISBN 0-13-604623-1**
 Instructor \$18.00 **ISBN 0-13-604670-3**

32204-07 Introduction to Ferrous Metal Piping Practices (5 Hours)

Covers various types of iron and steel pipe and fittings and provides step-by-step instructions for cutting, threading, and joining ferrous piping.

Trainee \$18.00 **ISBN 0-13-604624-X**
 Instructor \$18.00 **ISBN 0-13-604671-1**

32205-07 Identify, Install, and Maintain Valves (10 Hours)

Explains how to remove and install threaded and flanged valves, how to replace valve stem O-ring and bonnet gaskets, and how to repack a valve stuffing box. Also discusses the purpose of valve packing.

Trainee \$18.00 **ISBN 0-13-604625-8**
 Instructor \$18.00 **ISBN 0-13-604672-X**



Industrial Maintenance

NEW! 32206-07 Hydrostatic and Pneumatic Testing (10 Hours)

Describes non-destructive and pressure testing of systems and equipment.

Trainee \$18.00 ISBN 0-13-604626-6
Instructor \$18.00 ISBN 0-13-604673-8

32207-07 Introduction to Bearings (15 Hours)

Introduces plain, ball, roller, thrust, guide, flanged, pillow block, and takeup bearings. Discusses bearing materials and designations.

Trainee \$18.00 ISBN 0-13-604627-4
Instructor \$18.00 ISBN 0-13-604674-6

32208-07 Low-Pressure Steam Systems (10 Hours)

Introduces the components and functions of basic steam systems, including boilers, steam traps, and blowdown recovery systems.

Trainee \$18.00 ISBN 0-13-604628-2
Instructor \$18.00 ISBN 0-13-604675-4

NEW! 32209-07 High-Pressure Steam Systems and Auxiliaries (20 Hours)

Explains the functioning of high-pressure steam systems used in industry.

Trainee \$18.00 ISBN 0-13-604664-9
Instructor \$18.00 ISBN 0-13-604676-2

NEW! 32210-07 Distillation Towers and Vessels (20 Hours)

Introduces the various types and functioning of distillation towers and vessels, including recovery vessels and condensate processing.

Trainee \$18.00 ISBN 0-13-604665-7
Instructor \$18.00 ISBN 0-13-604677-0

NEW! 32211-07 Heaters, Furnaces, Heat Exchangers, Cooling Towers, and Fin Fans (30 Hours)

Introduces the trainee to the equipment used to transfer and remove heat from systems in process.

Trainee \$18.00 ISBN 0-13-604666-5
Instructor \$18.00 ISBN 0-13-604679-7

NEW! 32212-07 Introduction to Tube Work (10 Hours)

Covers the basics of working with heat exchanger and furnace tubing and tube sheets.

Trainee \$18.00 ISBN 0-13-604667-3
Instructor \$18.00 ISBN 0-13-604680-0

Product Supplements

Computerized Testing Software ISBN 0-13-614781-X	\$30
Transparency Masters ISBN 0-13-614797-6	\$25
NEW! PowerPoint® Presentation Slides (in color) (planned for Fall 2008: visit www.nccer.org for ISBN)	

L3 INDUSTRIAL MAINTENANCE MECHANIC

REVISED!	LEVEL 3
Curriculum Notes	
<ul style="list-style-type: none"> Total Hours: 180 Published: 1998 To Be Revised: Summer 2008, Third Edition 	
PAPERBACK	
Trainee Guide: \$88	ISBN 0-13-604496-4
Annotated Instructor's Guide: \$88	ISBN 0-13-604498-0

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

32301-08 Advanced Towers and Vessels (15 Hours)

Covers cat crackers, process vessels, and chemical reactors in greater depth.

Trainee \$18.00 ISBN 0-13-604681-9
Instructor \$18.00 ISBN 0-13-604656-8

32302-08 Advanced Trade Math (30 Hours)

Explains right triangle trigonometry and its use in the trade. Also covers interpolation, equilateral and isosceles triangles and the laws of acute triangles.

Trainee \$18.00 ISBN 0-13-604682-7
Instructor \$18.00 ISBN 0-13-604657-6

32303-08 Precision Tools (20 Hours)

Explains how to select, inspect, use and care for levels, feeler gauges, calipers, micrometers, height gauges and surface plates, dial indicators, protractors, parallels and gauge blocks, trammels, and pyrometers.

Trainee \$18.00 ISBN 0-13-604683-5
Instructor \$18.00 ISBN 0-13-604658-4

32304-08 Installing Bearings (20 Hours)

Explains how to remove, troubleshoot, and install tapered, thrust, spherical roller, pillow block, and angular contact ball bearings.

Trainee \$18.00 ISBN 0-13-604684-3
Instructor \$18.00 ISBN 0-13-604659-2

32305-08 Installing Couplings (15 Hours)

Identifies various types of couplings, and covers installation procedures using the press-fit method and the interference-fit method. Also covers coupling removal procedures.

Trainee \$18.00 ISBN 0-13-604685-1
Instructor \$18.00 ISBN 0-13-604661-4

32306-08 Conventional Alignment (20 Hours)

Covers types of misalignment, aligning couplings using a straightedge and feeler gauge, adjusting parallel and angular alignment, using a dial indicator, and eliminating coupling stress.

Trainee \$18.00 ISBN 0-13-604686-X
Instructor \$18.00 ISBN 0-13-604662-2

32307-08 Setting Baseplates and Prealignment (30 Hours)

Explains how to lay out and install baseplates and soleplates. Describes how to field-verify a plate installation. Covers precision leveling procedures and performing clearance installation. Also describes basic steps for setting motors and pumps.

Trainee \$18.00 ISBN 0-13-604688-6
Instructor \$18.00 ISBN 0-13-604663-0

32308-08 Installing Mechanical Seals (20 Hours)

Covers function and advantages of mechanical seals, identifies parts and types of seals, and includes procedures for removing, inspecting, and installing mechanical seals.

Trainee \$18.00 ISBN 0-13-604689-4
Instructor \$18.00 ISBN 0-13-604699-1

32309-08 Installing Belt and Chain Drives (10 Hours)

Covers the sizes, uses, and installation procedures of six types of drive belts and two types of chain drives.

Trainee \$18.00 ISBN 0-13-604655-X
Instructor \$18.00 ISBN 0-13-604700-9

Product Supplements

Computerized Testing Software ISBN 0-13-605581-8	\$30
Transparency Masters ISBN 0-13-605567-2	\$25

INDUSTRIAL MAINTENANCE MECHANIC

Level 4—Due December 2008

PAPERBACK

Trainee Guide: \$88 ISBN 0-13-604501-4
Annotated Instructor's Guide: \$88 ISBN 0-13-604502-2

Industrial Maintenance

L4 INDUSTRIAL MAINTENANCE

LEVEL 4

Curriculum Notes

- 222.5 Hours (207.5 required; 15 elective)
- Published: 1998 Updated: 2000
- Revision is under way for both tracks: Industrial Maintenance Mechanic due December 2008; Industrial Maintenance Electrical & Instrumentation Technician due Summer 2009.

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-012586-5**
 Instructor's Guide: \$88 **ISBN 0-13-012587-3**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

32401 Practical Applications of Lighting

(10 Hours)

Covers various lighting installations, applications, and wiring systems.

Trainee \$18.00 **ISBN 0-13-031825-6**
 Instructor \$18.00 **ISBN 0-13-031841-8**

32402 Standby and Emergency Systems

(12.5 Hours)

Explains NEC® installation requirements for electric generators and storage batteries.

Trainee \$18.00 **ISBN 0-13-031826-4**
 Instructor \$18.00 **ISBN 0-13-031842-6**

32403 Advanced Controls (20 Hours)

Explains operating principles of solid-state controls along with their practical applications. Motor braking, jogging, plugging, and safety interlocks are also covered.

Trainee \$18.00 **ISBN 0-13-031827-2**
 Instructor \$18.00 **ISBN 0-13-031843-4**

32404 Commercial and Industrial

Refrigeration (22.5 Hours)

Covers components and operation of refrigeration systems, with emphasis on systems used in cold storage and other commercial food preservation applications. Also covers the components and operation of ice-making machines.

Trainee \$18.00 **ISBN 0-13-031828-0**
 Instructor \$18.00 **ISBN 0-13-031844-2**

32405 Electricity in HVAC Systems (20 Hours)

Covers the basic principles of refrigeration and air conditioning, NEC® requirements, compressors, and HVAC control wiring and troubleshooting.

Trainee \$18.00 **ISBN 0-13-031829-9**
 Instructor \$18.00 **ISBN 0-13-031845-0**

32406 HVAC Controls (15 Hours)

Focuses on advanced HVAC controls in utilizing solid-state circuitry.

Trainee \$18.00 **ISBN 0-13-031820-5**
 Instructor \$18.00 **ISBN 0-13-031846-9**

32407 Conventional Alignment (30 Hours)

Covers types of misalignment, aligning couplings using a straightedge and feeler gauge, adjusting face and OD alignment using a dial indicator, and eliminating coupling stress.

Trainee \$18.00 **ISBN 0-13-031831-0**
 Instructor \$18.00 **ISBN 0-13-031847-7**

32408 Maintaining Valves (10 Hours)

Explains how to remove and install threaded and flanged valves, how to replace valve stem O-ring and bonnet gaskets, and how to repack a valve stuffing box. Also discusses the purpose of valve packing.

Trainee \$18.00 **ISBN 0-13-031833-7**
 Instructor \$18.00 **ISBN 0-13-031848-5**

32409 Identifying and Installing Valves

(20 Hours)

Identifies and provides installation methods for different types of valves. Also covers valve storage and handling.

Trainee \$18.00 **ISBN 0-13-031834-5**
 Instructor \$18.00 **ISBN 0-13-031849-3**

32410 Steam Traps (10 Hours)

Identifies types of steam traps, including mechanical, thermostatic, and thermodynamic steam traps, as well as strainers. Explains how to install steam traps and troubleshoot steam trap systems.

Trainee \$18.00 **ISBN 0-13-031835-3**
 Instructor \$18.00 **ISBN 0-13-031851-5**

32411 Steam Systems (15 Hours)

Covers safety procedures, turn-on, operation, and shutdown, as well as preventive maintenance procedures, piping systems associated with steam heating systems, and steam traps.

Trainee \$18.00 **ISBN 0-13-031836-1**
 Instructor \$18.00 **ISBN 0-13-031852-3**

32412 Programmable Logic Controllers

(from Instrumentation) (7.5 Hours)

Enables the trainee to properly describe the general functions, parts, and uses of programmable logic controllers.

Trainee \$18.00 **ISBN 0-13-031837-X**
 Instructor \$18.00 **ISBN 0-13-031853-1**

32413 High-Voltage Terminations/Splices

(10 Hours)

Offers an overview of the NEC® and cable manufacturer's requirements for high-voltage terminations and splices.

Trainee \$18.00 **ISBN 0-13-031838-8**
 Instructor \$18.00 **ISBN 0-13-031854-X**

32414 Vibration Analysis (5 Hours)

Covers the causes for vibration, vibration monitoring programs, vibration test equipment, and how to field balance machines.

Trainee \$18.00 **ISBN 0-13-031839-6**
 Instructor \$18.00 **ISBN 0-13-031855-8**

32415 Commercial Heating and Cooling

Systems (15 Elective Hours)

Covers operating principles, safety concerns, piping systems, and service requirements associated with different types of boilers, chillers, chilled water systems, and absorption equipment.

Trainee \$18.00 **ISBN 0-13-031830-2**
 Instructor \$18.00 **ISBN 0-13-031856-6**

L5 INDUSTRIAL MAINTENANCE

LEVEL 5

Curriculum Notes

- 237.5 Hours (207.5 required; 20 elective)
- Published: 1998 Updated: 2000

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-012588-1**
 Instructor's Guide: \$88 **ISBN 0-13-012589-X**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

32501 Preventive and Predictive Maintenance

(10 Hours)

Covers nondestructive testing, ultrasonics, radiography, eddy current inspection, magnetic particle inspection, acoustic emissions, infrared testing, vibration analysis, and tribology.

Trainee \$18.00 **ISBN 0-13-031858-2**
 Instructor \$18.00 **ISBN 0-13-031874-4**

32502 Performing Reverse Alignment

(30 Hours)

Using the reverse dial indicator method, teaches how to identify improper pipe hanger placement, measure shaft runout, and set up complex reverse dial indicator jigs and chart alignment.

Trainee \$18.00 **ISBN 0-13-031859-0**
 Instructor \$18.00 **ISBN 0-13-031875-2**

Industrial Maintenance

32503 Performing Laser Alignment (25 Hours)

Covers the use and operation of laser alignment systems and how to measure shaft sag, perform vertical alignment, and align machinery trains.

Trainee \$18.00

ISBN 0-13-031850-7

Instructor \$18.00

ISBN 0-13-031876-0

32504 Troubleshooting and Repairing Pneumatic Equipment (10 Hours)

Covers how to perform preventive maintenance, inspect components, and read schematic diagrams. Includes troubleshooting and repair procedures for pneumatic systems.

Trainee \$18.00

ISBN 0-13-031861-2

Instructor \$18.00

ISBN 0-13-031877-9

32505 Troubleshooting and Repairing Pumps (10 Hours)

Covers how to inspect, troubleshoot, and prepare pumps for shutdown. Includes removing pumps from the system, disassembly, and reassembly procedures.

Trainee \$18.00

ISBN 0-13-031862-0

Instructor \$18.00

ISBN 0-13-031878-7

32506 Troubleshooting and Repairing Hydraulic Equipment (10 Hours)

Explains how to inspect, troubleshoot, and repair hydraulic systems and components. Includes exercises on reading system schematic diagrams.

Trainee \$18.00

ISBN 0-13-031863-9

Instructor \$18.00

ISBN 0-13-031879-5

32507 Troubleshooting and Repairing Gearboxes (20 Hours)

Explains how to inspect, remove, reassemble, install, and maintain gearboxes. Covers measuring and adjusting backlash and bearing clearance.

Trainee \$18.00

ISBN 0-13-031864-7

Instructor \$18.00

ISBN 0-13-031870-1

32508 Programmable Logic Controllers (from Electrical) (30 Hours)

Covers the hardware and software used in modern programmable logic control systems. Also covers wiring and testing techniques.

Trainee \$18.00

ISBN 0-13-031866-3

Instructor \$18.00

ISBN 0-13-031882-5

32509 Instrument Drawings and Documents (10 Hours)

Familiarizes trainees with instrument symbols, abbreviations, and specific types of drawings and documents.

Trainee \$18.00

ISBN 0-13-031867-1

Instructor \$18.00

ISBN 0-13-031883-3

32510 Flow, Pressure, Level, and Temperature (10 Hours)

Presents devices used to measure flow, pressure, level, and temperature, along with their principles of operation.

Trainee \$18.00

ISBN 0-13-031868-X

Instructor \$18.00

ISBN 0-13-031884-1

32511 Process Control Theory (17.5 Hours)

Offers a comprehensive introduction to basic components and principles of operation of typical control systems found in industrial settings. Covers most common modes of control and their advantages and disadvantages. Applications are reviewed to reinforce understanding of fundamentals and major types of controls, individual components, and their roles in typical control loops.

Trainee \$18.00

ISBN 0-13-031869-8

Instructor \$18.00

ISBN 0-13-031885-X

32512 Precision Measuring Tools (25 Hours)

Explains how to select, inspect, use, and care for levels, feeler gauges, calipers, micrometers, height gauges and surface plates, dial indicators, protractors, parallels and gauge blocks, trammels, and pyrometers.

Trainee \$18.00

ISBN 0-13-031860-4

Instructor \$18.00

ISBN 0-13-031886-8

32513 Forklifts (10 Elective Hours)

Covers basic operation of rough terrain forklifts with an emphasis on safety.

Trainee \$18.00

ISBN 0-13-031871-X

Instructor \$18.00

ISBN 0-13-031887-6

32514 Fiber Optics (20 Elective Hours)

Explains the theory of operations of fiber-optic systems, how they are constructed, and the different types of splicing and testing methods used in today's systems.

Trainee \$18.00

ISBN 0-13-031872-8

Instructor \$18.00

ISBN 0-13-031888-4



Instrumentation

12113-01 Hoses (7.5 Hours)

Covers identifying hoses and fittings, proper storing and handling, cutting hoses, and installing a standard reusable fitting.

Trainee \$18.00

ISBN 0-13-868464-2

Instructor \$18.00

ISBN 0-13-868472-3

Product Supplements

Computerized Testing Software ISBN 0-13-061845-4	\$30
Transparency Masters ISBN 0-13-061834-9	\$25

L2 INSTRUMENTATION

LEVEL 2

Curriculum Notes

- 185 Hours
- Published: 1992 Revised: 2003

PAPERBACK

Trainee Guide: \$88

ISBN 0-13-047232-8

Annotated

Instructor's Guide: \$88

ISBN 0-13-047235-2

BINDER

Trainee Guide: \$93

ISBN 0-13-047234-4

Annotated

Instructor's Guide: \$93

ISBN 0-13-047236-0

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

12201-03 Craft-Related Mathematics (15 Hours)

Covers measurement of mass, weight, pressure, temperature, and flow, conversion of units, and their application to instrumentation.

Trainee \$18.00

ISBN 0-13-103264-X

Instructor \$18.00

ISBN 0-13-103280-1

12202-03 Instrumentation Drawings and Documents, Part Two (20 Hours)

Covers reading and interpreting of piping and instrumentation drawings, loop sheets, flow diagrams, isometrics, and orthographics, enabling trainees to identify types of instrumentation and the specifications for installation.

Trainee \$18.00

ISBN 0-13-103265-8

Instructor \$18.00

ISBN 0-13-103281-X

L1 INSTRUMENTATION

LEVEL 1



Curriculum Notes

- Total Hours: 210 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1992 Revised: 2001

PAPERBACK

Trainee Guide: \$60

ISBN 0-13-061602-8

Annotated

Instructor's Guide: \$60

ISBN 0-13-061604-4

BINDER

Trainee Guide: \$65

ISBN 0-13-061603-6

Annotated

Instructor's Guide: \$65

ISBN 0-13-061605-2

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

12101-01 Hand Tools for Instrumentation

(12.5 Hours)

Explains how to identify, inspect, use, and maintain hand tools used in the instrumentation craft.

Trainee \$18.00

ISBN 0-13-868167-8

Instructor \$18.00

ISBN 0-13-868175-9

12102-01 Electrical Safety (12.5 Hours)

Covers the necessary precautions to take for various electrical hazards found on the job and teaches the OSHA-mandated lockout/tagout procedure.

Trainee \$18.00

ISBN 0-13-868183-X

Instructor \$18.00

ISBN 0-13-868191-0

12103-01 Power Tools for Instrumentation

(10 Hours)

Describes how to identify, inspect, use, and maintain power tools used in instrumentation.

Trainee \$18.00

ISBN 0-13-868225-9

Instructor \$18.00

ISBN 0-13-868233-X

12104-01 Electrical Systems

for Instrumentation (22.5 Hours)

Covers basic electrical concepts, terms, meters, resistors, wiring, and fittings.

Trainee \$18.00

ISBN 0-13-868241-0

Instructor \$18.00

ISBN 0-13-868258-5

12105-01 Metallurgy for Instrumentation

(7.5 Hours)

Presents metals, their uses, and their applications in instrumentation. Includes standards and specifications for metals published by ASTM, ASME, AISI, SAE, and other organizations.

Trainee \$18.00

ISBN 0-13-868282-8

Instructor \$18.00

ISBN 0-13-868290-9

12106-01 Fasteners (7.5 Hours)

Explains how to properly identify, select, and install fasteners for specific instrumentation jobs.

Trainee \$18.00

ISBN 0-13-868324-7

Instructor \$18.00

ISBN 0-13-868332-8

12107-01 Instrumentation Drawings and

Documents, Part One (10 Hours)

Familiarizes trainees with instrument symbols, abbreviations, and specific types of drawings and documents.

Trainee \$18.00

ISBN 0-13-868340-9

Instructor \$18.00

ISBN 0-13-868357-3

12108-01 Gaskets and Packing (7.5 Hours)

Teaches how to recognize and properly install various types of gaskets, gasket materials, packing, and O-rings.

Trainee \$18.00

ISBN 0-13-868365-4

Instructor \$18.00

ISBN 0-13-868373-5

12109-01 Lubricants, Sealants, and Cleaners

(7.5 Hours)

Presents information on the proper use, storage, and handling of various types of lubricants, sealants, and cleaners.

Trainee \$18.00

ISBN 0-13-868381-6

Instructor \$18.00

ISBN 0-13-868399-9

12110-01 Flow, Pressure, Level,

and Temperature (10 Hours)

Presents devices used to measure flow, pressure, level, and temperature, along with their principles of operation.

Trainee \$18.00

ISBN 0-13-868407-3

Instructor \$18.00

ISBN 0-13-868415-4

12111-01 Tubing (12.5 Hours)

Introduces a variety of tubing, tubing materials, tools, and work practices. Covers proper storage and handling, cutting, deburring, reaming, bending, and flaring of tubing.

Trainee \$18.00

ISBN 0-13-868423-5

Instructor \$18.00

ISBN 0-13-868431-6

12112-01 Piping – 2" and Under (10 Hours)

Covers types of piping and includes practice calculating pipe length, cutting, deburring and reaming pipe, and threading outside threads.

Trainee \$18.00

ISBN 0-13-868449-9

Instructor \$18.00

ISBN 0-13-868456-1



Instrumentation

12203-03 Principles of Welding for Instrumentation (10 Hours)

Introduces different welding procedures used during instrument installation, basic techniques and applications, safety precautions, equipment, and basic brazing and welding procedures.

Trainee \$18.00 **ISBN 0-13-103266-6**
 Instructor \$18.00 **ISBN 0-13-103282-8**

12204-03 Process Control Theory (20 Hours)

Offers a comprehensive introduction to basic components and principles of operation of typical control systems found in industrial settings. Covers most common modes of control and their advantages and disadvantages. Reviews applications to reinforce understanding of fundamentals and major types of controls, individual components, and their roles in typical control loops.

Trainee \$18.00 **ISBN 0-13-103267-4**
 Instructor \$18.00 **ISBN 0-13-103283-6**

12205-03 Detectors, Secondary Elements, Transducers, and Transmitters (20 Hours)

Defines and introduces common instrumentation elements and their principles of operation. Covers identification of variables measured by each element and selection of the proper types of devices in an instrument loop using the device's technical manuals, specification sheets, pictures, or actual samples.

Trainee \$18.00 **ISBN 0-13-103269-0**
 Instructor \$18.00 **ISBN 0-13-103285-2**

12206-03 Controllers, Recorders, and Indicators (10 Hours)

Covers theory of operation and application of industry-standard process controllers, recorders, indicators, and pneumatic and electronic equipment.

Trainee \$18.00 **ISBN 0-13-103270-4**
 Instructor \$18.00 **ISBN 0-13-103286-0**

12207-03 Control Valves, Actuators, and Positioners (15 Hours)

Covers the construction, operation, and uses of a variety of control valves, actuators, and positioners, including identification and selection of control valves using applicable specifications and schematics.

Trainee \$18.00 **ISBN 0-13-103271-2**
 Instructor \$18.00 **ISBN 0-13-103287-9**

12208-03 Relays and Timers (7.5 Hours)

Presents the principles of operation and different variables measured by various instrumentation relays and timers. Also presents information on the selection of types of devices in a loop using specification sheets or samples.

Trainee \$18.00 **ISBN 0-13-103272-0**
 Instructor \$18.00 **ISBN 0-13-103288-7**

12209-03 Switches and Photoelectric Devices (5 Hours)

Covers principles of operation and different variables measured by various instrumentation switches and photoelectric devices and the selection of types of devices in a loop using specification sheets or samples.

Trainee \$18.00 **ISBN 0-13-103273-9**
 Instructor \$18.00 **ISBN 0-13-103289-5**

12210-03 Filters, Regulators, and Dryers (7.5 Hours)

Presents the construction, operation, and uses of filters, regulators, and dryers. Covers identification and selection of the correct component for installation using applicable specifications and schematics.

Trainee \$18.00 **ISBN 0-13-103274-7**
 Instructor \$18.00 **ISBN 0-13-103290-9**

12211-03 Analyzers and Monitors (5 Hours)

Presents the most common variations of instrumentation used to sample, analyze, and/or monitor industrial processes and includes the principles of their operation. Includes recognition and selection of instrumentation using technical manuals, specification sheets, pictures, or actual equipment samples.

Trainee \$18.00 **ISBN 0-13-103275-5**
 Instructor \$18.00 **ISBN 0-13-103291-7**

12212-03 Panel-Mounted Instruments (7.5 Hours)

Explains selection of instruments to be panel-mounted, locating the instruments using drawings, and procedures for installing the instruments into the panels.

Trainee \$18.00 **ISBN 0-13-103277-1**
 Instructor \$18.00 **ISBN 0-13-103293-3**

12213-03 Installing Field-Mounted Instruments (25 Hours)

Covers selection and mounting of instruments at locations other than panels, including stand mounting, in-line mounting, structure mounting, strap mounting, and insertion mounting.

Trainee \$18.00 **ISBN 0-13-103278-X**
 Instructor \$18.00 **ISBN 0-13-103294-1**

12214-03 Raceways for Instrumentation (17.5 Hours)

Introduces raceways and covers identification and selection of conduit, raceways, wireways, cable trays, fittings, and NEC® requirements for installation.

Trainee \$18.00 **ISBN 0-13-103279-8**
 Instructor \$18.00 **ISBN 0-13-103295-X**

Product Supplements

Computerized Testing Software ISBN 0-13-046690-5	\$30
Transparency Masters ISBN 0-13-049859-9	\$30

L3 INSTRUMENTATION

LEVEL 3

Curriculum Notes

- 152.5 Hours
- Published: 1992 Revised: 2003

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-102603-8**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-102605-4**

BINDER

Trainee Guide: \$93 **ISBN 0-13-102604-6**
 Annotated
 Instructor's Guide: \$93 **ISBN 0-13-102606-2**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

12301-03 Instrument Fitter's Math (20 Hours)

Discusses the application of right triangles in bending and installing tubing and conduit as it applies to instrumentation. Shows how to use a scientific calculator in applying instrumentation piping and fitting math.

Trainee \$18.00 **ISBN 0-13-103296-8**
 Instructor \$18.00 **ISBN 0-13-103305-0**

12302-03 Layout and Installation of Tubing and Piping Systems (45 Hours)

Introduces piping and tubing layout procedures. Explains the steps in creating a hand-sketched isometric drawing that can be applied in the piping and tubing installation. Introduces methods and procedures used to measure, cut, and bend and support piping and tubing.

Trainee \$18.00 **ISBN 0-13-103297-6**
 Instructor \$18.00 **ISBN 0-13-103306-9**

12303-03 Clean, Purge, and Test Tubing and Piping Systems (10 Hours)

Presents safe methods for cleaning, purging, blowing down, pressure testing, and leak testing tubing, piping, and hoses used in instrumentation.

Trainee \$18.00 **ISBN 0-13-103298-4**
 Instructor \$18.00 **ISBN 0-13-103307-7**

12304-03 Receive, Inspect, Handle, and Store Instrumentation (2.5 Hours)

Covers different methods for the proper handling, storage, and inspection of instrumentation equipment.

Trainee \$18.00 **ISBN 0-13-103299-2**
 Instructor \$18.00 **ISBN 0-13-103308-5**

Instrumentation

12305-03 Instrumentation Electrical Circuitry

(25 Hours)

Covers the theory and operation of common instrumentation circuits.

Trainee \$18.00 **ISBN 0-13-103301-8**
 Instructor \$18.00 **ISBN 0-13-103309-3**

12306-03 Grounding and Shielding of Instrumentation Wiring

(10 Hours)

Teaches the basics of grounding and shielding, including how to identify and select types of shielded cable, how to properly shield the cable, and the NEC® requirements regarding grounding.

Trainee \$18.00 **ISBN 0-13-103302-6**
 Instructor \$18.00 **ISBN 0-13-103310-7**

12307-03 Terminating Conductors

(20 Hours)

Teaches methods, procedures, and standards used in terminating and testing common types of conductors used in the electrical and electronic wiring of instrumentation devices.

Trainee \$18.00 **ISBN 0-13-103303-4**
 Instructor \$18.00 **ISBN 0-13-103311-5**

12308-03 Protective Measures for Instrumentation

(20 Hours)

Covers protective measures applied in instrumentation installations, including heat tracing, chemical treatment, and insulation.

Trainee \$18.00 **ISBN 0-13-103304-2**
 Instructor \$18.00 **ISBN 0-13-103312-3**

Product Supplements	
Computerized Testing Software ISBN 0-13-103323-9	\$30
Transparency Masters ISBN 0-13-103335-2	\$25

L4 INSTRUMENTATION

LEVEL 4

Curriculum Notes

- 147.5 Hours
- Published: 1993 Revised: 2003

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-108922-6**
 Annotated Instructor's Guide: \$88 **ISBN 0-13-108924-2**

BINDER

Trainee Guide: \$93 **ISBN 0-13-108923-4**
 Annotated Instructor's Guide: \$93 **ISBN 0-13-108925-0**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

12401-03 Digital Logic Circuits

(10 Hours)

Describes the various electronic circuits and gates used in digital control circuits and the truth tables for each. Covers variations on gates, such as flip-flops, shift registers, and counters.

Trainee \$18.00 **ISBN 0-13-109610-9**
 Instructor \$18.00 **ISBN 0-13-109621-4**

12402-03 Instrument Calibration and Configuration

(65 Hours)

Introduces methods of instrumentation calibration, including the three- and five-point methods. Covers components that require calibration in pneumatic, analog, and smart loops, as well as methods commonly used to calibrate these components.

Trainee \$18.00 **ISBN 0-13-109611-7**
 Instructor \$18.00 **ISBN 0-13-109622-2**

12403-03 Performing Loop Checks

(7.5 Hours)

Covers loop check steps, including verifying mechanical installation, validating that the loop has correct tag numbers, performing loop checks, and finally proving the loop.

Trainee \$18.00 **ISBN 0-13-109613-3**
 Instructor \$18.00 **ISBN 0-13-109623-0**

12404-03 Troubleshooting and Commissioning a Loop

(10 Hours)

Teaches methodical troubleshooting techniques used to locate problems in control loops. Also addresses how to isolate a loop in order to troubleshoot it. Covers commissioning of a loop once it is repaired, loop checked, and calibrated.

Trainee \$18.00 **ISBN 0-13-109614-1**
 Instructor \$18.00 **ISBN 0-13-109624-9**

12405-03 Tuning Loops

(15 Hours)

Introduces formulas and their applications to PID control. Offers a theory-based approach to PID control and its application in industrial process control. Addresses open, closed, and visual loop tuning.

Trainee \$18.00 **ISBN 0-13-109615-X**
 Instructor \$18.00 **ISBN 0-13-109625-7**

12406-03 Programmable Logic Controllers

(10 Hours)

Introduces the application of PLCs in industrial process control, as well as the binary numbering system used in computer-based control. Covers components of PLCs, including power supplies, I/O modules, processor modules, types of communication bus, and memory.

Trainee \$18.00 **ISBN 0-13-109616-8**
 Instructor \$18.00 **ISBN 0-13-109626-5**

12407-03 Distributed Control Systems

(10 Hours)

Describes how DCS was developed by combining the technologies of single loop control, direct digital control, and supervisory control. It covers DCS basic hardware requirements, how control loops are implemented into a DCS, types of data transmission used in DCS, communication protocols, and human interfaces.

Trainee \$18.00 **ISBN 0-13-109617-6**
 Instructor \$18.00 **ISBN 0-13-109627-3**

12408-03 Analyzers

(20 Hours)

Defines various types of analyzers and their applications in industrial process control. Includes a discussion of analyzers that measure or monitor variables such as density, specific gravity, viscosity, turbidity, flashpoint, oxidation-reduction potential (ORP), pH, conductivity of a liquid, oxygen, carbon monoxide, carbon dioxide, hydrogen sulfide, total hydrocarbon content (THC), and particulates in a clean room. Also defines chromatography and ultraviolet and infrared analyzers.

Trainee \$18.00 **ISBN 0-13-109619-2**
 Instructor \$18.00 **ISBN 0-13-109629-X**

Product Supplements	
Computerized Testing Software ISBN 0-13-109124-7	\$30
Transparency Masters ISBN 0-13-109121-2	\$25



Insulating

L1 INSULATING

LEVEL 1

Curriculum Notes

- Total Hours: 170 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1996 Updated: 1999
- A Spanish translation is planned for 2008. Only the Trainee Guide, tests and transparency masters will be translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests. Ordering information below.

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-909359-1**
 Instructor's Guide: \$60 **ISBN 0-13-909383-4**

BINDER

Trainee Guide: \$65 **ISBN 0-13-909367-2**
 Instructor's Guide: \$65 **ISBN 0-13-909391-5**

SPANISH VERSION (Paperback)

Trainee Guide: \$60 **ISBN 0-13-605705-5**
 Instructor's Guide: \$60 **ISBN 0-13-605706-3**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

19101 Orientation (5 Hours)

Provides an overview of the insulation industry, factors to consider when choosing a vocation in the insulation industry, and why insulation is used.

Trainee \$18.00 **ISBN 0-13-909169-6**
 Instructor \$18.00 **ISBN 0-13-909235-8**

19102 Trade Relations (7.5 Hours)

Provides an understanding of contracts, relationships with other members of the construction team, and the importance of communication.

Trainee \$18.00 **ISBN 0-13-909177-7**
 Instructor \$18.00 **ISBN 0-13-909243-9**

19103 Tools of the Trade (7.5 Hours)

Identifies tools of the insulation trade, their proper use and care, and safety procedures for each.

Trainee \$18.00 **ISBN 0-13-909185-8**
 Instructor \$18.00 **ISBN 0-13-909250-1**

19104 Material Handling, Storage, and Distribution (2.5 Hours)

Covers receiving, stacking, and storage of insulation materials, as well as material movement.

Trainee \$18.00 **ISBN 0-13-909193-9**
 Instructor \$18.00 **ISBN 0-13-909268-4**

19105 Characteristics of Pipe Insulation (5 Hours)

Covers identification of types, sizes, and uses of pipe and insulation thickness and the relationship between pipe size and insulation size.

Trainee \$18.00 **ISBN 0-13-909201-3**
 Instructor \$18.00 **ISBN 0-13-909276-5**

19106 Installing Fiberglass Pipe Insulation (30 Hours)

Describes characteristics of fiberglass pipe insulation and sizing requirements, as well as characteristics of ASJ jacketing.

Trainee \$18.00 **ISBN 0-13-909219-6**
 Instructor \$18.00 **ISBN 0-13-909284-6**

19107 Installing Pipe Fittings, Valves, and Flanges (40 Hours)

Explains insulation requirements for basic types of fittings, valves, and flanges; cutting and installing mitered segments to pipe elbows; cutting for application to flanged pipe valves and insulating pipe flanges; and cutting and installing plug 90-degree ells.

Trainee \$18.00 **ISBN 0-13-909227-7**
 Instructor \$18.00 **ISBN 0-13-909292-7**

L2 INSULATING

LEVEL 2

Curriculum Notes

- 147.5 Hours
- Published: 1996 Updated: 1999

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-909417-2**
 Instructor's Guide: \$88 **ISBN 0-13-909433-4**

BINDER

Trainee Guide: \$93 **ISBN 0-13-909425-3**
 Instructor's Guide: \$93 **ISBN 0-13-909441-5**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

19201 Installing Flexible Foam Insulation (32.5 Hours)

Covers proper tool use and procedures for installing flexible foam insulation, including how to cut and install flexible foam insulation on pipe fittings, valves, flanges, equipment, and air ducts.

Trainee \$18.00 **ISBN 0-13-910167-5**
 Instructor \$18.00 **ISBN 0-13-910266-3**

19202 Installing Blanket Insulation for Ducts (7.5 Hours)

Covers fiberglass blanket installation to ducts and apparatus and discusses vapor-sealed blanket insulation facings.

Trainee \$18.00 **ISBN 0-13-910175-6**
 Instructor \$18.00 **ISBN 0-13-910274-4**

19203 Installing Board Insulation for Ducts (20 Hours)

Covers fiberglass board insulation applications, such as cutting fiberglass board insulation to fit over standing seams and stiffeners, vapor-seal applications, and cutting and installing fiberglass board insulation on round or oval ducts.

Trainee \$18.00 **ISBN 0-13-910183-7**
 Instructor \$18.00 **ISBN 0-13-910282-5**

19204 Installing Calcium Silicate/Expanded Perlite Pipe Insulation (15 Hours)

Discusses the safe handling and storage of calcium silicate pipe insulation, how to make accurate cuts, and how to install single- and double-layers of calcium silicate pipe insulation.

Trainee \$18.00 **ISBN 0-13-910191-8**
 Instructor \$18.00 **ISBN 0-13-910290-6**

19205 Installing Mineral Wool Insulation (12.5 Hours)

Describes the measuring requirements for mineral wool insulation and how to cut and score mineral wool insulation. Also discusses the various attachments used on mineral wool, installation methods, sealing requirements, and how to use pin welding equipment.

Trainee \$18.00 **ISBN 0-13-910209-4**
 Instructor \$18.00 **ISBN 0-13-910308-2**

19206 Installing Rigid Foam Insulation (20 Hours)

Covers the proper use of tools; handling and storage of rigid foam insulation; measuring, cutting, installing, and sealing rigid foam plastic and cellular glass insulation; cryogenic installation; expansion joints; contraction joints; and vapor stops.

Trainee \$18.00 **ISBN 0-13-910217-5**
 Instructor \$18.00 **ISBN 0-13-910316-3**

Insulating

19207 Installing Board and Block Insulation

(17.5 Hours)

Covers the measuring requirements of board and block insulation; scoring, beveling, and cutting methods; and how to install board and block insulation on flat or curved surfaces and on large diameter tanks.

Trainee \$18.00

ISBN 0-13-910225-6

Instructor \$18.00

ISBN 0-13-910324-4

19208 Cement and Fabric Finishes & Mastics

(10 Hours)

Covers the proper use of finishing tools, cleanup and protection procedures, and the limitations of cements, fabric finishes, and mastics.

Trainee \$18.00

ISBN 0-13-910233-7

Instructor \$18.00

ISBN 0-13-910332-5

19209 Plumbing Systems (7.5 Hours)

Covers cold and hot water plumbing systems, drainage systems in buildings, insulation requirements on plumbing systems, and piping hook-ups.

Trainee \$18.00

ISBN 0-13-910241-8

Instructor \$18.00

ISBN 0-13-910340-6

19210 Chilled and Hot Water Heating Systems (5 Hours)

Covers chilled and hot water heating and dual-temperature systems, including the types of pipes and equipment used in various systems. Explains which systems require insulation and why.

Trainee \$18.00

ISBN 0-13-910258-2

Instructor \$18.00

ISBN 0-13-910357-0

L3 INSULATING

LEVEL 3

Curriculum Notes

- 147.5 Hours
- Published: 1997 Updated: 1999

PAPERBACK

Trainee Guide: \$88

ISBN 0-13-909458-X

Instructor's Guide: \$88

ISBN 0-13-909474-1

BINDER

Trainee Guide: \$93

ISBN 0-13-909466-0

Instructor's Guide: \$93

ISBN 0-13-909482-2

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

19301 Trade Math (7.5 Hours)

Covers the use of measuring tools and scale rulers; describes how to make decimal, dimensional, and temperature conversions; and explains the use of formulas for calculating insulation surface areas of various objects.

Trainee \$18.00

ISBN 0-13-910365-1

Instructor \$18.00

ISBN 0-13-910480-1

19302 Air Duct Systems (5 Hours)

Covers the identification of various duct systems and their associated components.

Trainee \$18.00

ISBN 0-13-910373-2

Instructor \$18.00

ISBN 0-13-910498-4

19303 Theory of Heat Transfer and Moisture Effects (2.5 Hours)

Describes methods of heat transfer and moisture migration and discusses the application of various types of insulation to slow or prevent these processes.

Trainee \$18.00

ISBN 0-13-910381-3

Instructor \$18.00

ISBN 0-13-910506-9

19304 Adhesives and Their Uses (2.5 Hours)

Covers the identification, application, and use of various types of adhesives.

Trainee \$18.00

ISBN 0-13-910399-6

Instructor \$18.00

ISBN 0-13-910514-X

19305 Steam, Condensate, and Process Water Systems (5 Hours)

Covers the identification of steam and condensate piping in buildings and describes various steam and process water systems and their components.

Trainee \$18.00

ISBN 0-13-910407-0

Instructor \$18.00

ISBN 0-13-910522-0

19306 Large Boilers, Breechings, Precipitators, and Apparatus (10 Hours)

Describes various types of boilers and related equipment, and their insulation requirements.

Trainee \$18.00

ISBN 0-13-910415-1

Instructor \$18.00

ISBN 0-13-910530-1

19307 Refrigeration and Cryogenic Systems (2.5 Hours)

Covers the fundamentals of air conditioning and refrigeration systems and their insulation requirements. Also describes the special insulation requirements of extremely low-temperature cryogenic systems.

Trainee \$18.00

ISBN 0-13-910423-2

Instructor \$18.00

ISBN 0-13-910548-4

19308 Specialized Insulation Systems

(5 Hours)

Describes special-application insulation systems, including low-temperature and prefabricated panels; refractory insulation; soft pads and pre-shaped removable covers; preinsulated systems; spray, foam, and pour-in-place insulation; fire stops; noise and sound control systems; and cryogenic applications.

Trainee \$18.00

ISBN 0-13-910431-3

Instructor \$18.00

ISBN 0-13-910555-7

19309 Blueprints and Specifications

(12.5 Hours)

Describes how to determine the insulation requirements of a project by interpreting construction drawings. Includes a set of blueprints with the Trainee module.

Trainee \$18.00

ISBN 0-13-910449-6

Instructor \$18.00

ISBN 0-13-910563-8

19310 Jacketing Fabrication – Piping and Fittings (42.5 Hours)

Covers the identification and applications of pipes and pipe fittings and describes the various types of pipe and fitting jacketing, along with layout installation procedures and securements.

Trainee \$18.00

ISBN 0-13-910456-9

Instructor \$18.00

ISBN 0-13-910571-9

19311 Jacketing Fabrication – Vessels and Equipment (40 Hours)

Covers the identification of various types of vessel and equipment jacketing, along with layout, fabrication, installation procedures, and securements.

Trainee \$18.00

ISBN 0-13-910464-X

Instructor \$18.00

ISBN 0-13-910589-1

19312 Sheet Metal Lagging (12.5 Hours)

Describes the identification and application of common sheet metal tools, discusses fabrication and installation methods, and covers flashing and sealing techniques.

Trainee \$18.00

ISBN 0-13-910472-0

Instructor \$18.00

ISBN 0-13-910597-2



Ironworking

L1 IRONWORKING

LEVEL 1

Curriculum Notes

- Total Hours: 227.5 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1982 Updated: 1999

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-014864-4**
 Instructor's Guide: \$60 **ISBN 0-13-014867-9**

BINDER

Trainee Guide: \$65 **ISBN 0-13-014865-2**
 Instructor's Guide: \$65 **ISBN 0-13-014868-7**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

30101 Introduction to the Trade (5 Hours)

Discusses the historical development of the ironworking trade. Explains personal qualities that contribute to successful employment. Describes the organization and purpose of apprenticeship training, and the safety obligations of the employer and employee.

Trainee \$18.00 **ISBN 0-13-015411-3**
 Instructor \$18.00 **ISBN 0-13-015420-2**

30102 Trade Safety (7.5 Hours)

Describes the consequences of on-the-job accidents and the responsibilities of OSHA. Identifies potential ironworker health and safety hazards and safe work practices around cranes.

Trainee \$18.00 **ISBN 0-13-015412-1**
 Instructor \$18.00 **ISBN 0-13-015431-8**

30103 Means and Methods of Access

(7.5 Hours)

Explains the safe use of personnel lifts. Discusses the safe use and operation of aerial platforms, hoists, and fall protection systems.

Trainee \$18.00 **ISBN 0-13-015414-8**
 Instructor \$18.00 **ISBN 0-13-015432-6**

30104 Tools and Equipment of the Trade

(10 Hours)

Identifies and explains commonly used safety tools and equipment. Describes the proper use of common hand tools and power tools. Identifies power sources for ironworking tools.

Trainee \$18.00 **ISBN 0-13-015415-6**
 Instructor \$18.00 **ISBN 0-13-015433-4**

30105 Construction Cranes One (10 Hours)

Identifies and describes common lifting equipment and construction cranes. Describes using crane manuals, performing recordkeeping, and following safety requirements. Provides procedures for assembling construction cranes.

Trainee \$18.00 **ISBN 0-13-015416-4**
 Instructor \$18.00 **ISBN 0-13-015434-2**

30106 Rigging for Ironworking One (10 Hours)

Explains the history and safety concerns of rigging. Explains using and splicing wire rope and fiber rope for rigging operations.

Trainee \$18.00 **ISBN 0-13-015417-2**
 Instructor \$18.00 **ISBN 0-13-015435-0**

30107 Rigging Equipment and Hardware

(7.5 Hours)

Identifies the basic equipment used in rigging and describes proper lacing and square reeving. Describes performing safety inspections of hooks and chains. Explains the use of rigging equipment and slings.

Trainee \$18.00 **ISBN 0-13-015418-0**
 Instructor \$18.00 **ISBN 0-13-015436-9**

30108 Trade Blueprints and Processes

(12.5 Hours)

Identifies the materials and parts used in steel frame buildings. Explains the advantages of pre-engineered structures and the components of reinforced steel structures. Describes the post-tensioning process and the uses of precast concrete.

Trainee \$18.00 **ISBN 0-13-015419-9**
 Instructor \$18.00 **ISBN 0-13-015437-7**

30109 Materials Handling and Storage

(5 Hours)

Identifies safety hazards associated with the handling and storage of materials. Covers the principles for unloading and yarding reinforcing steel, joists, miscellaneous iron, and structural iron.

Trainee \$18.00 **ISBN 0-13-015410-5**
 Instructor \$18.00 **ISBN 0-13-015438-5**

30110 Structural Ironworking One (7.5 Hours)

Identifies and explains the types of construction that utilize structural steel and the properties of structural steel. Describes the effects of high and low temperatures on steel strength and the principles of structural steel stresses.

Trainee \$18.00 **ISBN 0-13-015422-9**
 Instructor \$18.00 **ISBN 0-13-015430-X**

30111 Plumbing, Aligning, and Guying

(5 Hours)

Describes the purpose and function of aligning and plumbing steel structures and identifies the tools used for performing plumbing and aligning. Identifies and explains column base and baseplate components and foundation failures. Provides procedures for performing plumbing and aligning.

Trainee \$18.00 **ISBN 0-13-015423-7**
 Instructor \$18.00 **ISBN 0-13-015441-5**

30112 Fastening (5 Hours)

Explains recognizing A-325 and A-490 bolts, washers, and nuts. Describes the types of A-325 bolts and the procedures used with the calibrated wrench and the turn-of-nut tightening methods.

Trainee \$18.00 **ISBN 0-13-015424-5**
 Instructor \$18.00 **ISBN 0-13-015442-3**

30113 Oxyfuel Cutting (17.5 Hours)

Explains safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and setup requirements. Explains how to light, adjust, and shut down oxyfuel equipment. Allows trainees to perform cutting techniques that include straight line, piercing, bevels, washing, and gouging.

Trainee \$18.00 **ISBN 0-13-015425-3**
 Instructor \$18.00 **ISBN 0-13-015443-1**

30114 Introduction to Arc Welding (15 Hours)

Describes safety precautions required when arc welding. Explains welding machines and associated equipment, as well as safety equipment and area preparation. Describes how to strike an arc and make basic welds.

Trainee \$18.00 **ISBN 0-13-015426-1**
 Instructor \$18.00 **ISBN 0-13-015444-X**

30115 Steel Joists and Joist Girders One

(5 Hours)

Explains how to recognize the different types of bar joists and how bar joists are identified. Describes proper procedures for rigging, storing, and erecting steel joists and bar joists. Explains the use of joist girders in steel joist construction systems.

Trainee \$18.00 **ISBN 0-13-015427-X**
 Instructor \$18.00 **ISBN 0-13-015445-8**

30116 Metal Decking (10 Hours)

Identifies and explains decking types and profiles and how decking is packaged, shipped, and stored. Describes erecting decking and placing concrete safely. Explains the effects of deck penetrations and damage.

Trainee \$18.00 **ISBN 0-13-015428-8**
 Instructor \$18.00 **ISBN 0-13-015446-6**

Ironworking

30117 Field Fabrication One (15 Hours)

Identifies the safety hazards associated with field fabrication. Explains how to use common layout tools and fabricate C-shapes, T-shapes, and W-shapes to given dimensions.

Trainee \$18.00 **ISBN 0-13-015429-6**
 Instructor \$18.00 **ISBN 0-13-015448-2**

Product Supplements	
Computerized Testing Software ISBN 0-13-015509-8	\$30
Transparency Masters ISBN 0-13-015502-0	\$30

L2 IRONWORKING

LEVEL 2

Curriculum Notes

- 145 Hours
- Published: 1982 Updated: 1999

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-018314-8**
 Instructor's Guide: \$88 **ISBN 0-13-018316-4**

BINDER

Trainee Guide: \$93 **ISBN 0-13-018315-6**
 Instructor's Guide: \$93 **ISBN 0-13-018318-0**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

30201 Position Arc Welding (20 Hours)

Identifies and explains weld joints, weld positions, and open V-butt welds. Describes how to prepare arc welding equipment and how to make flat welds, horizontal welds, vertical welds, and overhead welds.

Trainee \$18.00 **ISBN 0-13-019280-5**
 Instructor \$18.00 **ISBN 0-13-019301-1**

30202 Introduction to Reinforcing Steel and Steel Fabrication (10 Hours)

Describes the applications of reinforcing bars, bar bends, and the basic work processes involved in placing reinforcing bars. Identifies tools and types of ties used in securing rebars and describes how to read and interpret bar tags.

Trainee \$18.00 **ISBN 0-13-019291-0**
 Instructor \$18.00 **ISBN 0-13-019302-X**

30203 Miscellaneous Ironworking (7.5 Hours)

Explains structures and locations where various types of ornamental or miscellaneous iron are used. Describes ornamental and miscellaneous ironwork work processes and the ferrous and nonferrous metals used.

Trainee \$18.00 **ISBN 0-13-019292-9**
 Instructor \$18.00 **ISBN 0-13-019303-8**

30204 Trade Math (10 Hours)

Describes how to use mathematical processes to estimate and calculate load weights and compare safe working loads. Covers the mathematical processes used to calculate reeving efficiency.

Trainee \$18.00 **ISBN 0-13-019293-7**
 Instructor \$18.00 **ISBN 0-13-019304-6**

30205 Blueprint Reading Two (10 Hours)

Introduces types of structural plans and describes the information included on each type. Presents the sequences of erection plans for each step of construction and identifies the symbols and abbreviations used on drawings. Comes with ten 11" x 17" drawings.

Trainee \$18.00 **ISBN 0-13-019294-5**
 Instructor \$18.00 **ISBN 0-13-019305-4**

30206 Rigging Two (10 Hours)

Identifies and describes the uses of slings and miscellaneous rigging equipment, sling capacities, and sling angles. Explains the mechanical advantage achieved by reeving and how to calculate reeving efficiency.

Trainee \$18.00 **ISBN 0-13-019295-3**
 Instructor \$18.00 **ISBN 0-13-019306-2**

30207 Structural Ironworking Two (30 Hours)

Describes pre-erection activities for structural steel. Provides procedures for erecting bearing devices, columns, beams, girders, joists, bracing, and bridging.

Trainee \$18.00 **ISBN 0-13-019296-1**
 Instructor \$18.00 **ISBN 0-13-019307-0**

30208 Steel Joists and Joist Girders Two (15 Hours)

Identifies the types of joists, methods of end support, and the types of bridging available. Explains how to locate the ironworking information on framing plans and describes steel joist installation procedures. Comes with one 11" x 17" drawing.

Trainee \$18.00 **ISBN 0-13-019297-X**
 Instructor \$18.00 **ISBN 0-13-019309-7**

30209 Construction Cranes Two (15 Hours)

Identifies the types of mobile cranes found on construction sites and explains the components and reeving patterns used. Describes factors affecting mobile crane lifting capacities and special lifting situations. Covers mobile crane hazards and the required crane operator qualifications.

Trainee \$18.00 **ISBN 0-13-019298-8**
 Instructor \$18.00 **ISBN 0-13-019300-3**

30210 Levels, Transits, and Electronic Survey Devices (17.5 Hours)

Explains construction industry terms and symbols and the math applications associated with surveying activities. Describes the surveying tools used in ironworking and surveying applications and procedures.

Trainee \$18.00 **ISBN 0-13-019299-6**
 Instructor \$18.00 **ISBN 0-13-019311-9**

Product Supplements	
Computerized Testing Software ISBN 0-13-018912-X	\$30
Transparency Masters ISBN 0-13-018916-2	\$25

L3 IRONWORKING

LEVEL 3

Curriculum Notes

- 152.5 Hours
- Published: 1984 Updated: 2000

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-030939-7**
 Instructor's Guide: \$88 **ISBN 0-13-030942-7**

BINDER

Trainee Guide: \$93 **ISBN 0-13-030930-3**
 Instructor's Guide: \$93 **ISBN 0-13-030943-5**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

30301 Weld Testing (10 Hours)

Introduces welding and nondestructive testing codes and specifications that govern welding. Identifies the different types of weld imperfections and the nondestructive testing methods used to identify these imperfections.

Trainee \$18.00 **ISBN 0-13-031236-3**
 Instructor \$18.00 **ISBN 0-13-031240-1**



Ironworking

30302 Pre-Engineered Systems (7.5 Hours)

Identifies the structural components and accessories of pre-engineered steel buildings and describes their installation. Describes the pre-erection and erection procedures that apply to their installation and the safety precautions associated with the installation.

Trainee \$18.00 **ISBN 0-13-031237-1**
 Instructor \$18.00 **ISBN 0-13-031251-7**

30303 Ornamental Ironworking (5 Hours)

Identifies the types of ornamental metal and describes the different types of components used in ornamental ironworking. Explains the skills required to fabricate and install ornamental components safely.

Trainee \$18.00 **ISBN 0-13-031239-8**
 Instructor \$18.00 **ISBN 0-13-031252-5**

30304 Stud Welding (10 Hours)

Introduces the stud welding process, stud welding safety, and identifies the equipment used to weld studs. Provides step-by-step procedures to set up welding equipment and guidelines to make acceptable stud welds with proper stud placement. Explains testing of stud welds.

Trainee \$18.00 **ISBN 0-13-031230-4**
 Instructor \$18.00 **ISBN 0-13-031254-1**

30305 Post-Tensioning (5 Hours)

Introduces materials, storage, applications, and installation techniques for strand, wire, and bar post-tensioning systems. Explains the procedures used to safely place, stress, and grout different types of tendons used in post-tensioning systems.

Trainee \$18.00 **ISBN 0-13-031241-X**
 Instructor \$18.00 **ISBN 0-13-031255-X**

30306 Placing and Tying Reinforcing Steel (20 Hours)

Introduces reinforcing steel and explains some of the building code requirements related to placing and tying reinforcing steel safely. Explains the placement of reinforcing steel in concrete footings and foundations and in vertical and horizontal concrete members.

Trainee \$18.00 **ISBN 0-13-031242-8**
 Instructor \$18.00 **ISBN 0-13-031256-8**

30307 Construction Cranes Three (10 Hours)

Identifies and describes the use of tower cranes and electric overhead cranes. Explains crane safety hazards and precautions.

Trainee \$18.00 **ISBN 0-13-031243-6**
 Instructor \$18.00 **ISBN 0-13-031257-6**

30308 Special Rigging (10 Hours)

Explains techniques for air tugger rigging and rigging with gin poles, Chicago booms, A-frames, davits, balance beams, pump handles, high lines, caterpillar dollies, and pipe rollers.

Trainee \$18.00 **ISBN 0-13-031244-4**
 Instructor \$18.00 **ISBN 0-13-031258-4**

30309 Field Fabrication Two (25 Hours)

Explains the fabrication of pipe railings, ladders, channel bucks, and stair stringers to given specifications.

Trainee \$18.00 **ISBN 0-13-031245-2**
 Instructor \$18.00 **ISBN 0-13-031259-2**

30310 Demolition (10 Hours)

Identifies the tools used to remove rivets and explains the demolition skills required to remove structural steel beams, steel columns, and steel reinforced concrete columns safely.

Trainee \$18.00 **ISBN 0-13-031247-9**
 Instructor \$18.00 **ISBN 0-13-031250-9**

30311 Precast/Tilt-Up Erection (20 Hours)

Identifies structural and architectural precast concrete building components and accessories erected using the tilt-up process. Identifies the lifting inserts and rigging required for different tilt-up components and explains connecting and bracing precast wall panels.

Trainee \$18.00 **ISBN 0-13-031248-7**
 Instructor \$18.00 **ISBN 0-13-031262-2**

30312 Structural Ironworking Three (20 Hours)

Explains the techniques used to plumb, align and guy steel structures. Provides procedures to install trusses, grating, and checker plate. Also explains the hazards and risks associated with ironworking.

Trainee \$18.00 **ISBN 0-13-031249-5**
 Instructor \$18.00 **ISBN 0-13-031263-0**

Product Supplements

Transparency Masters

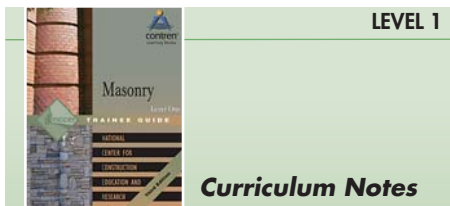
ISBN 0-13-031160-X

\$25



Masonry

L1 MASONRY



LEVEL 1

Curriculum Notes

- Total Hours: 185 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1983 Revised: 2004, Second Edition
- Includes full-color insert
- Also available in Spanish. Only the Trainee Guide, tests and transparency masters have been translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests. Ordering information below.

HARDCOVER

Trainee Guide: \$60 **ISBN 0-13-228718-8**

PAPERBACK

Annotated Instructor's Guide: \$60 **ISBN 0-13-109162-X**

BINDER

Trainee Guide: \$65 **ISBN 0-13-109161-1**

Annotated Instructor's Guide: \$65 **ISBN 0-13-109163-8**

SPANISH VERSION (Paperback)

Trainee Guide: \$60 **ISBN 0-13-605713-6**

Annotated Instructor's Guide: \$60 **ISBN 0-13-605749-7**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

28101-04 Introduction to Masonry (20 Hours)

Introduces the trainee to the historic and current materials and processes used in the masonry trade and covers safety concerns specific to the trade. Explains the uses of brick and concrete block, along with basic techniques for mixing mortar and laying masonry units. Covers opportunities in the trade. Allows the trainee to mix mortar and perform basic bricklaying.

Trainee \$18.00 **ISBN 0-13-109871-3**

Instructor \$18.00 **ISBN 0-13-109876-4**

28102-04 Masonry Tools and Equipment

(12.5 Hours)

Describes the hand and power tools and equipment used in mixing mortar and in cutting, laying, and finishing masonry units. Explains the safe operation of masonry saws and mortar mixing machines.

Trainee \$18.00 **ISBN 0-13-109872-1**

Instructor \$18.00 **ISBN 0-13-109878-0**

28103-04 Measurements, Drawings, and Specifications (10 Hours)

Guides the trainee in using mathematics to calculate distances, areas, and volumes common in masonry work. Describes the information typically found on residential construction drawings and specifications. Includes blueprints.

Trainee \$18.00 **ISBN 0-13-109873-X**

Instructor \$18.00 **ISBN 0-13-109879-9**

28104-04 Mortar (10 Hours)

Explains the types and properties of mortar and the materials used in the mixture, including admixtures. Includes instructions for mixing mortar by hand and machine and describes how to properly store mortar.

Trainee \$18.00 **ISBN 0-13-109874-8**

Instructor \$18.00 **ISBN 0-13-109880-2**

28105-04 Masonry Units and Installation Techniques (60 Hours)

Covers all types of concrete and clay masonry units and their applications. Explains the use of ties and reinforcing materials. Covers the processes used in placing masonry units, including layout and setup, spreading mortar, cutting brick and block, laying to the line, making corners, tooling joints, patching, and cleanup.

Trainee \$18.00 **ISBN 0-13-109875-6**

Instructor \$18.00 **ISBN 0-13-109881-0**

Product Supplements	
Computerized Testing Software ISBN 0-13-109909-4	\$30
Transparency Masters ISBN 0-13-109896-9	\$25
NEW! PowerPoint® Presentation Slides (in color) ISBN 0-13-602564-1	\$40
National Construction Career Test available with this title (see p. 7 for more information)	

L2 MASONRY

LEVEL 2

Curriculum Notes

- 152.5 Hours
- Published: 1983 Revised: 2005, Second Edition

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-109164-6**

Annotated Instructor's Guide: \$88 **ISBN 0-13-109167-0**

BINDER

Trainee Guide: \$93 **ISBN 0-13-109165-4**

Annotated Instructor's Guide: \$93 **ISBN 0-13-109168-9**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

28201-05 Residential Plans and Drawing Interpretation (12.5 Hours)

Covers information the mason will need to work with residential plans and construction drawings and be able to convert that information into action on the job. Includes understanding the organization and format of plans, dimensioning and scaling, and estimating materials quantities from information on the plans.

Trainee \$18.00 **ISBN 0-13-168328-4**

Instructor \$18.00 **ISBN 0-13-168336-5**

28202-05 Residential Masonry (25 Hours)

Covers the construction techniques for residential and small structure foundations, steps, patios, decks, chimneys, and fireplaces. Describes work activities that the mason must perform, as well as those that tie into the masonry work.

Trainee \$18.00 **ISBN 0-13-168330-6**

Instructor \$18.00 **ISBN 0-13-168338-1**

28203-05 Grout and Other Reinforcement (15 Hours)

Focuses on the use of grout and other types of reinforcement, such as reinforcing steel to strengthen and support masonry structures. Describes the locations where grout can be used and the techniques for placement. Discusses the use and application of various types of reinforcing steel bars.

Trainee \$18.00 **ISBN 0-13-168331-4**

Instructor \$18.00 **ISBN 0-13-168339-X**



Masonry

28204-05 Metal Work in Masonry (15 Hours)

Acquaints the mason with the various types of metal components, including metal rods, joint reinforcements, plates, anchors, fasteners, and hollow metal frames for doors and windows, and how they are installed.

Trainee \$18.00 **ISBN 0-13-168332-2**
 Instructor \$18.00 **ISBN 0-13-168340-3**

28205-05 Advanced Laying Techniques (50 Hours)

Contains detailed information that directs the mason in accomplishing the actual construction of walls, arches, and other useful structures. Explains construction techniques, safety requirements, and interaction with structure components.

Trainee \$18.00 **ISBN 0-13-168333-0**
 Instructor \$18.00 **ISBN 0-13-168341-1**

28206-05 Construction Techniques and Moisture Control (20 Hours)

Describes techniques used to construct openings in masonry walls, the application of insulation, and methods of moisture control as they relate to the mason's trade. Explains properties and uses of materials used in moisture control. Describes various methods of insulating structures.

Trainee \$18.00 **ISBN 0-13-168334-9**
 Instructor \$18.00 **ISBN 0-13-168342-X**

28207-05 Construction Inspection and Quality Control (15 Hours)

Introduces the quality control requirements for masonry construction. Presents procedures for inspection and testing of masonry materials and finished masonry construction.

Trainee \$18.00 **ISBN 0-13-168335-7**
 Instructor \$18.00 **ISBN 0-13-168343-8**

Product Supplements

Computerized Testing Software ISBN 0-13-109911-6	\$30
Transparency Masters ISBN 0-13-109897-7	\$25
NEW! PowerPoint® Presentation Slides (in color) ISBN 0-13-602621-4	\$40

L3 MASONRY

LEVEL 3

Curriculum Notes

- 168.5 Hours (146 required; 22.5 elective)
- Published: 1984 Revised: 2005, Second Edition

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-109169-7**
 Annotated Instructor's Guide: \$88 **ISBN 0-13-109171-9**

BINDER

Trainee Guide: \$93 **ISBN 0-13-109170-0**
 Annotated Instructor's Guide: \$93 **ISBN 0-13-109172-7**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

28301-05 Masonry in High-Rise Construction (17.5 Hours)

Describes the activities involved in organizing and implementing the construction of high-rise buildings. Focuses on the masonry construction techniques used in high-rise construction. Emphasizes safety and logistics.

Trainee \$18.00 **ISBN 0-13-228999-7**
 Instructor \$18.00 **ISBN 0-13-229005-7**

28302-05 Specialized Materials and Techniques (60 Hours)

Describes the many specialized materials and techniques used in the masonry trade. Covers properties and work requirements for such materials as natural and cultured stone, acid brick, refractory brick, structural tile, and glass block. Presents techniques for working under cold- and hot-weather conditions and explains construction of various types of masonry sound barriers.

Trainee \$18.00 **ISBN 0-13-229000-6**
 Instructor \$18.00 **ISBN 0-13-229007-3**

28303-05 Repair and Restoration (15 Hours)

Explains the most common problems that appear in masonry structures and describes various techniques that can be used to repair them, including tuckpointing, brick replacement, crack sealing, waterproofing, and stain removal.

Trainee \$18.00 **ISBN 0-13-229001-4**
 Instructor \$18.00 **ISBN 0-13-229043-X**

28304-05 Commercial Drawings (12.5 Hours)

Provides information about the format and content of commercial drawings and their use in conveying specific construction requirements. Describes the standard format for specifications.

Trainee \$18.00 **ISBN 0-13-229002-2**
 Instructor \$18.00 **ISBN 0-13-229044-8**

28305-05 Estimating (25 Hours)

Covers the basic procedures for doing takeoffs and estimating quantities of masonry material and accessories. Several different methods are described, including coursing, square foot, rule of thumb, and table methods. Describes computer-based estimating aids.

Trainee \$18.00 **ISBN 0-13-229003-0**
 Instructor \$18.00 **ISBN 0-13-229045-6**

28306-05 Site Layout—Distance Measurement and Leveling (22.5 Elective Hours)

Covers the principles, equipment, and methods used to perform the site layout task of distance measurement and differential leveling. Also covers information about the layout responsibilities of surveyors, field engineers, and masons; understanding and using site/plot plan drawings; and methods used for on-site communication.

Trainee \$18.00 **ISBN 0-13-229004-9**
 Instructor \$18.00 **ISBN 0-13-229046-4**

28307-05 (MT101) Introductory Skills for the Crew Leader (16 Hours)

Covers basic project planning and scheduling techniques as well as coordination and communication of work assignments to masonry work crews and other trades and crafts. Also describes project setup and materials purchasing requirements.

Trainee \$40.00 **ISBN 0-13-103593-2**
 Instructor \$60.00 **ISBN 0-13-103594-0**

NOTE: This module is from the Contren® Management Learning Series (see page 100 for more information). Students may be eligible to receive craft and management transcripts from NCCER's National Registry.

Product Supplements

Computerized Testing Software ISBN 0-13-109912-4	\$30
Transparency Masters ISBN 0-13-109898-5	\$25
NEW! PowerPoint® Presentation Slides (in color) ISBN 0-13-602622-2	\$40



Millwright

L1 MILLWRIGHT



LEVEL 1

Curriculum Notes

- Total Hours: 147.5 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1992 Revised: 2006, Third Edition

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-227288-1**
 Annotated Instructor's Guide: \$60 **ISBN 0-13-227290-3**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

15101-06 Orientation to the Trade (5 Hours)

Explains the history of the trade and discusses the various career paths that can be followed by a millwright. Describes some of the characteristic environments and types of work to be encountered.

Trainee \$18.00 **ISBN 0-13-613078-X**
 Instructor \$18.00 **ISBN 0-13-613079-8**

15102-06 Millwright Hand Tools (15 Hours)

Introduces various hand tools used in the millwright trade. Explains basic hand tool safety and covers the methods for selecting, inspecting, using, and maintaining these tools.

Trainee \$18.00 **ISBN 0-13-229009-X**
 Instructor \$18.00 **ISBN 0-13-229015-4**

15103-06 Fasteners and Anchors (10 Hours)

Identifies the various types of fasteners and anchors used by millwrights, including their applications and installation procedures.

Trainee \$18.00 **ISBN 0-13-229010-3**
 Instructor \$18.00 **ISBN 0-13-229016-2**

15104-06 Basic Layout (20 Hours)

Discusses the tools used in layout. Explains how to lay out baselines using the arc method and 3-4-5 method.

Trainee \$18.00 **ISBN 0-13-229011-1**
 Instructor \$18.00 **ISBN 0-13-229017-0**

15105-06 Gaskets and O-Rings (10 Hours)

Describes gaskets and O-rings and their applications. Provides instructions for laying out, cutting, and installing gaskets.

Trainee \$18.00 **ISBN 0-13-229012-X**
 Instructor \$18.00 **ISBN 0-13-229018-9**

15106-06 Oxyfuel Cutting (15 Hours)

Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and provides instructions for setting up, lighting, and using the equipment. Covers straight line cutting, piercing, beveling, washing, and gouging.

Trainee \$18.00 **ISBN 0-13-229013-8**
 Instructor \$18.00 **ISBN 0-13-229019-7**

Product Supplements	
Computerized Testing Software ISBN 0-13-229133-9	\$30
Transparency Masters ISBN 0-13-229155-X	\$25
NEW! PowerPoint® Presentation Slides (in color) ISBN 0-13-602618-4	\$40

L2 MILLWRIGHT

LEVEL 2

Curriculum Notes

- 150 Hours
- Published: 1993 Revised: 2007, Third Edition

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-227292-X**
 Annotated Instructor's Guide: \$88 **ISBN 0-13-228589-4**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

15201-07 Intermediate Trade Math (20 Hours)

Explains ratios and proportions. Covers basic algebra, area, volume, circumference, and circular speed problems. Describes how to use a scientific calculator.

Trainee \$18.00 **ISBN 0-13-614641-4**
 Instructor \$18.00 **ISBN 0-13-614651-1**

15202-07 Field Sketching (10 Hours)

Teaches the basic skills needed to create the field sketches used to convey information about how parts should be made or assembled.

Trainee \$18.00 **ISBN 0-13-614642-2**
 Instructor \$18.00 **ISBN 0-13-614653-8**

15203-07 Intermediate Blueprint Reading (20 Hours)

Describes the orthographic projection, isometric, and schematic drawings used to show piping, hydraulic, and pneumatic systems.

Trainee \$18.00 **ISBN 0-13-614643-0**
 Instructor \$18.00 **ISBN 0-13-614654-6**

15204-07 Specialty Tools (10 Hours)

Explains how to select, inspect, use, and maintain torque multipliers, cable cutters, nut splitters, keyseat rules, various gauges, and hardness testers.

Trainee \$18.00 **ISBN 0-13-614644-9**
 Instructor \$18.00 **ISBN 0-13-614655-4**

15205-07 Millwright Power Tools (20 Hours)

Introduces different types of millwright power tools and provides step-by-step procedures for selecting, using, and maintaining these tools.

Trainee \$18.00 **ISBN 0-13-614646-5**
 Instructor \$18.00 **ISBN 0-13-614656-2**

15206-07 Rigging (20 Hours)

Explains how to identify, select, and inspect rigging hardware. Also covers lifting capacity charts, load balancing, and pick points.

Trainee \$18.00 **ISBN 0-13-614647-3**
 Instructor \$18.00 **ISBN 0-13-614657-0**

15207-07 Setting Baseplates and Soleplates (15 Hours)

Explains how to lay out and install baseplates and soleplates. Describes how to field-verify a plate installation.

Trainee \$18.00 **ISBN 0-13-614648-1**
 Instructor \$18.00 **ISBN 0-13-614658-9**

15208-07 Lubrication (20 Hours)

Explains lubrication safety, storage, and classifications. Covers lubricant and additive selection, lubrication equipment, and lubricating charts.

Trainee \$18.00 **ISBN 0-13-614649-X**
 Instructor \$18.00 **ISBN 0-13-614659-7**

15209-07 Introduction to Bearings (15 Hours)

Introduces the trainee to plain, ball, roller, thrust, guide, flanged, pillow block, and takeup bearings. Discusses bearing materials and designations.

Trainee \$18.00 **ISBN 0-13-614650-3**
 Instructor \$18.00 **ISBN 0-13-614661-9**

Product Supplements	
Computerized Testing Software ISBN 0-13-229134-7	\$30
Transparency Masters ISBN 0-13-229156-8	\$25
NEW! PowerPoint® Presentation Slides (in color) (planned for Fall 2008: visit www.nccer.org for ISBN)	



Millwright

L3 MILLWRIGHT

LEVEL 3

REVISED!

Curriculum Notes

- Total Hours: 160
- Published: 1998 To Be Revised: Spring 2008, Third Edition

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-614431-4**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-614432-2**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

15301-08 Advanced Trade Math (20 Hours)

Explains right triangle trigonometry and its use in the trade. Also covers interpolation, equilateral and isosceles triangles and the laws of acute triangles.

Trainee \$18.00 **ISBN 0-13-604759-9**
 Instructor \$18.00 **ISBN 0-13-604772-6**

15302-08 Precision Measuring Tools (20 Hours)

Explains how to select, inspect, use and care for levels, calipers, micrometers, height gauges and surface plates, dial indicators, protractors, parallels and gauge blocks, trammels, and pyrometers.

Trainee \$18.00 **ISBN 0-13-604725-4**
 Instructor \$18.00 **ISBN 0-13-604773-4**

15303-08 Installing Packing (10 Hours)

Explains the types of packing and packing materials found in a typical stuffing box. Covers how to remove packing and how to install compression packing and lip-type packing.

Trainee \$18.00 **ISBN 0-13-604732-7**
 Instructor \$18.00 **ISBN 0-13-604780-7**

15304-08 Installing Seals (5 Hours)

Covers the applications, removal, and installation procedures for dynamic and static seals, and lip, cup, oil, and labyrinth seals.

Trainee \$18.00 **ISBN 0-13-604727-0**
 Instructor \$18.00 **ISBN 0-13-604775-0**

15305-08 Installing Mechanical Seals

(20 Hours)

Covers function and advantages of mechanical seals, identifies parts and types of seals, and includes procedures for removing, inspecting, and installing mechanical seals.

Trainee \$18.00 **ISBN 0-13-604733-5**
 Instructor \$18.00 **ISBN 0-13-604781-5**

15306-08 Removing and Installing Bearings

(20 Hours)

Explains how to remove, troubleshoot, and install tapered, thrust, spherical roller, pillow block, and angular contact ball bearings.

Trainee \$18.00 **ISBN 0-13-604726-2**
 Instructor \$18.00 **ISBN 0-13-604774-2**

15307-08 Couplings (15 Hours)

Identifies various types of couplings and covers installation procedures using the press-fit method and the interference-fit method. Also covers coupling removal procedures.

Trainee \$18.00 **ISBN 0-13-604728-9**
 Instructor \$18.00 **ISBN 0-13-604776-9**

15308-08 Fabricating Shims (5 Hours)

Describes types of shim stock and materials and explains the procedures for fabricating shims.

Trainee \$18.00 **ISBN 0-13-604731-9**
 Instructor \$18.00 **ISBN 0-13-604779-3**

15309-08 Alignment Fixtures and Specialty Jigs (10 Hours)

Explains the applications and fabrication procedures for angle iron, chain, complex reverse-indicator, Christmas tree, and piano wire jigs.

Trainee \$18.00 **ISBN 0-13-604769-6**
 Instructor \$18.00 **ISBN 0-13-604782-3**

15310-08 Prealignment for Equipment Installation (15 Hours)

Explains how to level equipment using jack bolts, wedges, and shims. Covers precision leveling procedures and performing clearance installation. Also describes basic steps for setting motors and pumps.

Trainee \$18.00 **ISBN 0-13-604730-0**
 Instructor \$18.00 **ISBN 0-13-604778-5**

15311-08 Installing Belt and Chain Drives (10 Hours)

Covers the sizes, uses, and installation procedures of six types of drive belts and two types of chain drives.

Trainee \$18.00 **ISBN 0-13-604770-X**
 Instructor \$18.00 **ISBN 0-13-604783-1**

15312-08 Installing Fans and Blowers (10 Hours)

Identifies and explains how to install axial-flow fans, centrifugal fans, and roots-type and screw-type blowers.

Trainee \$18.00 **ISBN 0-13-604771-8**
 Instructor \$18.00 **ISBN 0-13-604784-X**

Product Supplements

Computerized Testing Software ISBN 0-13-614783-6	\$30
Transparency Masters ISBN 0-13-614799-2	\$25
NEW! PowerPoint® Presentation Slides (in color) (planned for Fall 2008: visit www.nccer.org for ISBN)	

L4 MILLWRIGHT

LEVEL 4

Curriculum Notes

- 175 Hours
- Published: 1993 Updated: 1998
- A revision is under way and due in stock December 2008. To backorder the revisions, please use the ISBNs listed following the last module description.

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-245812-8**
 Instructor's Guide: \$88 **ISBN 0-13-245820-9**

BINDER

Trainee Guide: \$93 **ISBN 0-13-265836-4**
 Instructor's Guide: \$93 **ISBN 0-13-265422-9**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

15401 Conveyors (5 Hours)

Identifies and explains the purposes, operation, and major parts of roller, belt, chain, screw, and pneumatic conveyors. Includes safe working practices.

Trainee \$18.00 **ISBN 0-13-873761-4**
 Instructor \$18.00 **ISBN 0-13-873779-7**

15402 Basic Hydraulic Systems (10 Hours)

Explains hydraulic system safety and basic principles of hydraulics, including Pascal's law and Bernoulli's principle. Explains the function of fluids, parts, pumps, and motors.

Trainee \$18.00 **ISBN 0-13-873787-8**
 Instructor \$18.00 **ISBN 0-13-873795-9**

15403 Basic Pneumatic Systems (15 Hours)

Covers pneumatic safety, characteristics of gases and how they are compressed, pneumatic transmission of energy, and compressor operation.

Trainee \$18.00 **ISBN 0-13-873803-3**
 Instructor \$18.00 **ISBN 0-13-873811-4**

Millwright

15404 Troubleshooting and Repairing Compressors (20 Hours)

Discusses compressor operation, compressor types, intake filters, inter-coolers and after-coolers, and how to troubleshoot and repair air compressors.

Trainee \$18.00 **ISBN 0-13-873829-7**
Instructor \$18.00 **ISBN 0-13-873837-8**

15405 Vibration Analysis (5 Hours)

Covers the causes for vibration, vibration monitoring programs, vibration test equipment, and how to field balance machines.

Trainee \$18.00 **ISBN 0-13-873860-2**
Instructor \$18.00 **ISBN 0-13-873878-5**

15406 Setting Baseplates and Soleplates (15 Hours)

Explains how to establish baseplate and soleplate locations and lay them out, installation procedures, and how to field-verify a plate installation.

Trainee \$18.00 **ISBN 0-13-873886-6**
Instructor \$18.00 **ISBN 0-13-873894-7**

15407 Conventional Alignment (30 Hours)

Covers types of misalignment, aligning couplings using a straightedge and feeler gauge, adjusting face and OD alignment, using a dial indicator, and eliminating coupling stress.

Trainee \$18.00 **ISBN 0-13-873902-1**
Instructor \$18.00 **ISBN 0-13-873910-2**

15408 Pumps (20 Hours)

Explains centrifugal, rotary, reciprocating, metering, and vacuum pump operation and installation methods.

Trainee \$18.00 **ISBN 0-13-873928-5**
Instructor \$18.00 **ISBN 0-13-873936-6**

15409 Troubleshooting and Repairing Pumps (10 Hours)

Covers how to inspect, troubleshoot, and prepare pumps for shutdown. Includes removing pumps from the system, disassembly, and reassembly.

Trainee \$18.00 **ISBN 0-13-873944-7**
Instructor \$18.00 **ISBN 0-13-873951-X**

15410 Troubleshooting and Repairing Hydraulic Equipment (10 Hours)

Explains how to inspect, troubleshoot, and repair hydraulic systems and components.

Trainee \$18.00 **ISBN 0-13-873969-2**
Instructor \$18.00 **ISBN 0-13-873977-3**

15411 Troubleshooting and Repairing Gearboxes (20 Hours)

Explains how to inspect, remove, reassemble, install, and maintain gearboxes. Covers measuring and adjusting backlash and bearing clearance.

Trainee \$18.00 **ISBN 0-13-873985-4**
Instructor \$18.00 **ISBN 0-13-873993-5**

15412 Troubleshooting and Repairing Conveyors (15 Hours)

Explains how to maintain, troubleshoot, and repair conveyors, including belt splicing and replacing sprockets, bearings, and conveying devices.

Trainee \$18.00 **ISBN 0-13-874025-9**
Instructor \$18.00 **ISBN 0-13-874033-X**

Ordering Information for the Third Edition due December 2008:

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-604506-5**

Annotated
Instructor's Guide: \$88 **ISBN 0-13-604507-3**

L5 MILLWRIGHT

LEVEL 5

Curriculum Notes

- 170 Hours
- Published: 1993 Updated: 1998
- A revision is under way and due in stock Spring 2009.

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-245838-1**

Instructor's Guide: \$88 **ISBN 0-13-245846-2**

BINDER

Trainee Guide: \$93 **ISBN 0-13-265844-5**

Instructor's Guide: \$93 **ISBN 0-13-772831-X**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

15501 Advanced Blueprint Reading (25 Hours)

Covers reading plant or foundation layouts, assembly and detail drawings, title blocks, and bills of materials.

Trainee \$18.00 **ISBN 0-13-874041-0**
Instructor \$18.00 **ISBN 0-13-874058-5**

15502 Troubleshooting and Repairing Pneumatic Equipment (10 Hours)

Covers how to perform preventive maintenance, inspect components, and read schematic diagrams. Includes troubleshooting and repair procedures for pneumatic systems.

Trainee \$18.00 **ISBN 0-13-874066-6**
Instructor \$18.00 **ISBN 0-13-874074-7**

15503 Turbines (20 Hours)

Identifies and explains impulse and reaction turbines, types of turbines, and steam and gas turbine components.

Trainee \$18.00 **ISBN 0-13-874082-8**
Instructor \$18.00 **ISBN 0-13-874090-9**

15504 Troubleshooting and Repairing Turbine Equipment (15 Hours)

Covers how to inspect, troubleshoot, repair, and maintain turbines and turbine components.

Trainee \$18.00 **ISBN 0-13-874108-5**
Instructor \$18.00 **ISBN 0-13-874116-6**

15505 AC/DC Motor Operation (10 Hours)

Discusses basic theories of AC and DC electric motors and three-phase systems and motors. Includes troubleshooting procedures for motors.

Trainee \$18.00 **ISBN 0-13-874124-7**
Instructor \$18.00 **ISBN 0-13-874132-8**

15506 Preventive and Predictive Maintenance (10 Hours)

Covers nondestructive testing, ultrasonics, radiography, eddy current inspection, magnetic particle inspection, acoustic emissions, infrared testing, vibration analysis, and tribology.

Trainee \$18.00 **ISBN 0-13-874140-9**
Instructor \$18.00 **ISBN 0-13-874157-3**

15507 Performing Reverse Alignment (30 Hours)

Using the reverse dial indicator method teaches trainees to identify improper pipe hanger placement, measure shaft runout, set up complex reverse dial indicator jigs, and align charts.

Trainee \$18.00 **ISBN 0-13-874165-4**
Instructor \$18.00 **ISBN 0-13-874173-5**

15508 Performing Optical Alignment (25 Hours)

Explains how to align equipment using a jig transit and level equipment using an optical level. Covers how to use optical squares, alignment telescopes, and metrological bars.

Trainee \$18.00 **ISBN 0-13-874181-6**
Instructor \$18.00 **ISBN 0-13-874199-9**

15509 Performing Laser Alignment (25 Hours)

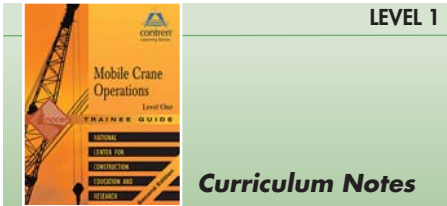
Covers the use and operation of laser alignment systems and how to measure shaft sag, perform vertical alignment, and align machinery trains.

Trainee \$18.00 **ISBN 0-13-874207-3**
Instructor \$18.00 **ISBN 0-13-874215-4**



Mobile Crane Operations

L1 MOBILE CRANE OPERATIONS



LEVEL 1

Curriculum Notes

- Total Hours: 147.5 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1997 Revised: 2004, Second Edition

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-109864-0**
Annotated
Instructor's Guide: \$60 **ISBN 0-13-109865-9**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

21101-04 Orientation to the Trade (5 Hours)

Provides an overview of the entire course and highlights the duties and responsibilities of a mobile crane operator. Discusses *ANSI B30.5* and *OSHA 550*, as well as career opportunities and operator requirements.

Trainee \$18.00 **ISBN 0-13-160065-6**
Instructor \$18.00 **ISBN 0-13-160071-0**

21102-04 Basic Principles of Cranes (15 Hours)

Offers trainees an introduction to mobile crane equipment with an in-depth discussion of terminology and nomenclature. Explains the basic scientific principles associated with mobile crane operation.

Trainee \$18.00 **ISBN 0-13-160066-4**
Instructor \$18.00 **ISBN 0-13-160072-9**

21103-04 Rigging Practices (15 Hours)

Offers a basic understanding of the fundamentals of rigging. Discusses a variety of rigging gear, components, and configurations and their applications within the mobile crane industry.

Trainee \$18.00 **ISBN 0-13-160067-2**
Instructor \$18.00 **ISBN 0-13-160073-7**

21104-04 Crane Safety (15 Hours)

Introduces various safety aspects of mobile crane operation, including equipment inspection, site hazard identification, and required personal protection equipment. Discusses how to work with site plans and specifications.

Trainee \$18.00 **ISBN 0-13-160068-0**
Instructor \$18.00 **ISBN 0-13-160074-5**

21105-04 Operating a Crane (25 Hours)

Describes the basic functions of a crane, as well as standard procedures for starting up and shutting down a crane. Provides the trainee with the opportunity to become familiar with the actual operation of a crane and the functions of its controls.

Trainee \$18.00 **ISBN 0-13-160070-2**
Instructor \$18.00 **ISBN 0-13-160075-3**

Product Supplements

Computerized Testing Software ISBN 0-13-160099-0	\$30
Transparency Masters ISBN 0-13-160097-4	\$25

L2 MOBILE CRANE OPERATIONS

LEVEL 2

Curriculum Notes

- 145 Hours
- Published: 1999 Revised: 2004, Second Edition

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-109866-7**
Annotated
Instructor's Guide: \$88 **ISBN 0-13-109867-5**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

21201-04 Communication (10 Hours)

Covers the fundamentals of the communication process; addressing abstractions, fear, and lack of experience; and environmental factors. Covers verbal and nonverbal methods of communications. Takes an in-depth look at the *ASME B30.5* hand signals, including the appropriate operator action when the signal is given and the expected machine movement.

Trainee \$18.00 **ISBN 0-13-160076-1**
Instructor \$18.00 **ISBN 0-13-160087-7**

21202-04 Machine Power Flow (27.5 Hours)

Discusses the various power systems that enable different cranes to perform their work. Discusses diesel and gasoline/propane engines and electrical/motor-generator, as well as mechanical, electrical, pneumatic, and hydraulic power systems.

Trainee \$18.00 **ISBN 0-13-160077-X**
Instructor \$18.00 **ISBN 0-13-160088-5**

21203-04 Preventive Maintenance (22.5 Hours)

Covers preventive maintenance and compliance inspections on a crane. Presents the safety considerations, procedures, and equipment/materials required for these inspections.

Trainee \$18.00 **ISBN 0-13-160079-6**
Instructor \$18.00 **ISBN 0-13-160089-3**

21204-04 Wire Rope (25 Hours)

Covers the components of wire rope and inspection requirements and procedures for wire rope, load blocks, and sheaves. Explains proper installation of wire rope, maintenance guidelines, and end terminations and preparations.

Trainee \$18.00 **ISBN 0-13-160080-X**
Instructor \$18.00 **ISBN 0-13-160090-7**

21205-04 Computer Aids/Operator Aids (20 Hours)

Provides information on load moment indicators, anti-two-block devices, load indicators, and other operator aids that are installed in cranes. Includes an in-depth look at the input devices associated with these operator aids and the information they provide.

Trainee \$18.00 **ISBN 0-13-160081-8**
Instructor \$18.00 **ISBN 0-13-160091-5**

21206-04 Load Dynamics (15 Hours)

Covers leverage and stability, operational quadrants, submerged lifts, non-centered lifts, and other factors that affect stability.

Trainee \$18.00 **ISBN 0-13-160082-6**
Instructor \$18.00 **ISBN 0-13-160092-3**

21207-04 On-Site Equipment Movement (25 Hours)

Covers site hazards and restrictions that could hinder on-site crane movement, safety considerations involved in crane movement over unlevel ground, pick-and-carry operations; and power line contact. Addresses flotation capacity.

Trainee \$18.00 **ISBN 0-13-160083-4**
Instructor \$18.00 **ISBN 0-13-160093-1**

Product Supplements

Computerized Testing Software ISBN 0-13-160100-8	\$30
Transparency Masters ISBN 0-13-160098-2	\$25

MOBILE CRANE CERTIFICATION PROGRAM

NCCER and NACB have formed a strategic partnership to develop and deliver certification mechanisms for mobile crane operators. Exams are based on ASME/OSHA standards and consist of four written exams and thirteen practical exams. Written exams will be administered by accredited NCCER test sites and practical exams will be administered by NACB-certified practical examiners. Practical examiner workshops will be offered nationwide.

To learn more about NCCER/NACB's mobile crane certification program, contact NCCER customer service at 888-622-3720.





Mobile Crane Operations

L3 MOBILE CRANE OPERATIONS

LEVEL 3

Curriculum Notes

- 150 Hours (140 required; 10 elective)
- Published: 1999 Revised: 2005, Second Edition

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-109868-3**

Annotated Instructor's Guide: \$88 **ISBN 0-13-109870-5**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

21301-05 Load Charts (25 Hours)

Discusses the importance of load charts and charts that apply to different configurations. Includes on-rubber, on-outrigger, jib, and deduction charts, as well as range diagrams and operational notes. Covers parts of line and capacity calculations.

Trainee \$18.00 **ISBN 0-13-168282-2**
 Instructor \$18.00 **ISBN 0-13-168291-1**

21302-05 Telescopic Boom Attachment Assembly and Disassembly (20 Hours)

Covers the stowing and erection of the swing-away extension, A-frame jib, and auxiliary single-sheave boom head, as well the assembly and removal of intermediate boom sections.

Trainee \$18.00 **ISBN 0-13-168283-0**
 Instructor \$18.00 **ISBN 0-13-168292-X**

21303-05 Advanced Operational Techniques (20 Hours)

Covers multi-crane lifts, critical lifts, blind lifts, and demolition. It also includes sections on how to use magnet and vacuum lifting devices and how to operate a mobile crane in cold weather.

Trainee \$18.00 **ISBN 0-13-168284-9**
 Instructor \$18.00 **ISBN 0-13-168293-8**

21304-05 Lift Planning (20 Hours)

Gives an in-depth discussion of lift plan implementation. Includes reference information, calculations, single- and multiple-crane lifting, critical lifts, and engineering considerations.

Trainee \$18.00 **ISBN 0-13-168286-5**
 Instructor \$18.00 **ISBN 0-13-168296-2**

21305-05 Hoisting Personnel (20 Hours)

Discusses ASME B30.23 and 29 CFR 1926.550(g) requirements while presenting advanced operation techniques for hoisting personnel.

Trainee \$18.00 **ISBN 0-13-168288-1**
 Instructor \$18.00 **ISBN 0-13-168297-0**

21306-05 Lattice Boom Assembly and Disassembly (25 Hours)

Provides a step-by-step look at short- and long-lattice boom assembly and disassembly.

Trainee \$18.00 **ISBN 0-13-168289-X**
 Instructor \$18.00 **ISBN 0-13-168298-9**

21307-05 Emergency Procedures (15 Hours)

Includes information on accident prevention and investigation, the hazards of power line contact, and various failures that may occur during lifting operations.

Trainee \$18.00 **ISBN 0-13-168285-7**
 Instructor \$18.00 **ISBN 0-13-168294-6**

21308-05 Transporting Requirements (10 Elective Hours)

Discusses the proper handling, loading and unloading, and securing procedures for mobile cranes and their components. Presents information on driver requirements and requirements for securing the mobile crane for transporting.

Trainee \$18.00 **ISBN 0-13-168290-3**
 Instructor \$18.00 **ISBN 0-13-168299-7**

Product Supplements

Computerized Testing Software ISBN 0-13-168346-2	\$30
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Painting

L1 PAINTING - COMMERCIAL & RESIDENTIAL

LEVEL 1

Curriculum Notes

- Total Hours: 152.5 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1982 Revised: 1997

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-771239-1**
 Instructor's Guide: \$60 **ISBN 0-13-771288-X**

BINDER

Trainee Guide: \$65 **ISBN 0-13-772914-6**
 Instructor's Guide: \$65 **ISBN 0-13-772922-7**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

07101 Careers in the Painting Trade (5 Hours)

Presents a brief history of the painting trade. Covers career opportunities, from apprenticeship/helper to managerial/business-related work. Describes the characteristics of the successful tradesperson, including productivity, appearance, personal hygiene, and dependability.

Trainee \$18.00 **ISBN 0-13-874249-9**
 Instructor \$18.00 **ISBN 0-13-874256-1**

07102 Safety (10 Hours)

Provides a comprehensive overview of the safety and precautions for working on construction sites with a focus on the painting trade. Covers methods of rigging and care of ladders, scaffolds, swing devices, and other equipment.

Trainee \$18.00 **ISBN 0-13-874223-5**
 Instructor \$18.00 **ISBN 0-13-874231-6**

07103 Ladders, Scaffolds, Lifts, and Fall Protection (10 Hours)

Covers methods of erecting, using and maintaining ladders, scaffolds, and lifts. Discusses fall protection equipment and safety practices used when working on ladders, scaffolds, and lifts.

Trainee \$18.00 **ISBN 0-13-793142-5**
 Instructor \$18.00 **ISBN 0-13-793159-X**

07104 Identifying Surface/Substrate Materials and Conditions (5 Hours)

Covers how to identify types of surfaces used in construction including wood, metal, masonry/concrete, plaster/drywall and synthetic substrates. Also discusses how to identify new, aged, or previously coated surface conditions of substrates and coatings.

Trainee \$18.00 **ISBN 0-13-874348-7**
 Instructor \$18.00 **ISBN 0-13-874355-X**

07105 Protecting Adjacent Surfaces (5 Hours)

Covers the tools, materials, and methods used for protecting adjacent surfaces and areas prior to surface preparation, paint spraying, etc.

Trainee \$18.00 **ISBN 0-13-874389-4**
 Instructor \$18.00 **ISBN 0-13-874397-5**

07106 Basic Surface Preparation (15 Hours)

Covers the tools, materials, and methods used for cleaning, repairing, and penetrating surfaces/substrates in preparation for coating. Describes basic methods used for surface preparation of wood, metal, plaster/drywall, cementitious, and synthetic surfaces/substrates.

Trainee \$18.00 **ISBN 0-13-793167-0**
 Instructor \$18.00 **ISBN 0-13-793175-1**

07107 Sealants and Repair/Fillers (5 Hours)

Describes the characteristics of commonly used types of sealants and fillers. Covers guidelines for selecting sealants/fillers and the tools and methods used for applying them on commonly used construction substrates.

Trainee \$18.00 **ISBN 0-13-793183-2**
 Instructor \$18.00 **ISBN 0-13-793191-3**

07108 Introduction to Paints and Coatings (10 Hours)

Describes the basic ingredients and film-forming processes common to all paints and coatings. Covers paint systems and functional categories of paints and coatings. Emphasizes water-based alkyd paints and coatings.

Trainee \$18.00 **ISBN 0-13-793209-X**
 Instructor \$18.00 **ISBN 0-13-793217-0**

07109 Brushing and Rolling Paints and Coatings (15 Hours)

Covers the types and selection of brushes, rollers, pads, mitts, and related accessories used for applying paints and coatings. Covers techniques used for brushing and rolling paints and coatings on interior and exterior surfaces. Also describes maintenance and storage methods for brushes and rollers.

Trainee \$18.00 **ISBN 0-13-874462-9**
 Instructor \$18.00 **ISBN 0-13-874470-X**

L2 PAINTING - COMMERCIAL & RESIDENTIAL

LEVEL 2

Curriculum Notes

- 145 Hours
- Published: 1982 Revised: 1997

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-771296-0**
 Instructor's Guide: \$88 **ISBN 0-13-771304-5**

BINDER

Trainee Guide: \$93 **ISBN 0-13-772930-8**
 Instructor's Guide: \$93 **ISBN 0-13-772948-0**

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

07201 Painting Failures and Remedies (7.5 Hours)

Covers failures of paints/coatings on exterior and interior substrates, causes of these failures, and their remedies. Focuses special attention on the nature of the substrates, application procedures, and surface preparation.

Trainee \$18.00 **ISBN 0-13-874702-4**
 Instructor \$18.00 **ISBN 0-13-874710-5**

07202 Job Planning and Completion (10 Hours)

Covers the process for estimating a job to submit a bid. Also covers the processes for planning and accomplishing a job from start to finish with emphasis placed on the importance and use of drawings, specifications, schedules, and other instructions.

Trainee \$18.00 **ISBN 0-13-874561-7**
 Instructor \$18.00 **ISBN 0-13-874579-X**

07203 Chemical Cleaning and Stripping (7.5 Hours)

Describes various kinds of chemical cleaners and strippers and how they are used to clean and/or remove unwanted material from substrates.

Trainee \$18.00 **ISBN 0-13-874645-1**
 Instructor \$18.00 **ISBN 0-13-874652-4**

07204 Low-Pressure Water Cleaning (7.5 Hours)

Covers the design and function of commonly used types of low-pressure washing equipment, including procedures for the safe operation and maintenance of typical equipment.

Trainee \$18.00 **ISBN 0-13-874629-X**
 Instructor \$18.00 **ISBN 0-13-874637-0**

Painting

07205 Abrasive Blasting (7.5 Hours)

Covers the basic design and function of abrasive blasting equipment, including general procedures for its use, related industry standards, and safety and health considerations.

Trainee \$18.00 ISBN 0-13-874785-7
Instructor \$18.00 ISBN 0-13-874793-8

07206 Drywall Finishing and Patching

(25 Hours)

Covers the materials and procedures used for drywall finishing and patching. Emphasizes on the techniques for finishing and patching drywall, including the use and care of tools, equipment and supplies, and safety.

Trainee \$18.00 ISBN 0-13-874744-X
Instructor \$18.00 ISBN 0-13-874751-2

07207 Stains (7.5 Hours)

Describes the different classes and/or kinds of stains, including their composition, selection for use, and application considerations.

Trainee \$18.00 ISBN 0-13-874587-0
Instructor \$18.00 ISBN 0-13-874595-1

07208 Clear Finishes (7.5 Hours)

Covers the composition, uses, and application of various clear finishes, including varnishes, lacquers, shellacs, and urethanes.

Trainee \$18.00 ISBN 0-13-874686-9
Instructor \$18.00 ISBN 0-13-874694-X

07209 Wood Finishing (22.5 Hours)

Covers basic wood science and technology subjects related to wood and wood products. Provides detailed procedures and techniques for wood surface preparation and the application of clear finishes to various kinds of wood.

Trainee \$18.00 ISBN 0-13-874769-5
Instructor \$18.00 ISBN 0-13-874777-6

07210 Coatings Two (10 Hours)

Describes unique properties, safety and health considerations, surface preparation, application, and testing and inspection of selected high-performance coatings.

Trainee \$18.00 ISBN 0-13-874603-6
Instructor \$18.00 ISBN 0-13-874611-7

07211 Spray Painting

(Conventional, Airless and HVLP) (32.5 Hours)

Covers the design and function of commonly used types of conventional, airless, and HVLP spraying equipment, including procedures for the safe operation and maintenance of typical equipment.

Trainee \$18.00 ISBN 0-13-874660-5
Instructor \$18.00 ISBN 0-13-874678-8

L3 PAINTING - COMMERCIAL & RESIDENTIAL

LEVEL 3

Curriculum Notes

- 152.5 Hours
- Published: 1984 Revised: 1998

PAPERBACK

Trainee Guide: \$88 ISBN 0-13-949041-8
Instructor's Guide: \$88 ISBN 0-13-949066-3

BINDER

Trainee Guide: \$93 ISBN 0-13-949058-2
Instructor's Guide: \$93 ISBN 0-13-949074-4

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

07301 Painting Failures and Remedies Two

(7.5 Hours)

Covers how to recognize and remedy paint/coating failures caused by improper preparation and application of coatings, as well as coating discoloration.

Trainee \$18.00 ISBN 0-13-874900-0
Instructor \$18.00 ISBN 0-13-874918-3

07302 Job Supervision, Planning, and Control (15 Hours)

Covers skills and leadership traits associated with the successful supervisor, including how to supervise and motivate employees, how to estimate a job, the use of contract documents, and methods for controlling materials and tools/equipment.

Trainee \$18.00 ISBN 0-13-874827-6
Instructor \$18.00 ISBN 0-13-874835-7

07303 Coatings Three (15 Hours)

Describes unique properties, safety and health considerations, surface preparation, application, and testing, and inspection of high-performance coatings used primarily to protect substrates for commercial or light industrial applications.

Trainee \$18.00 ISBN 0-13-875105-6
Instructor \$18.00 ISBN 0-13-875113-7

07304 Color and Tinting (10 Hours)

Covers the theory and definition of color; procedures for mixing, tinting, and matching colors; the use of the color wheel; and the Munsell, Federal Standard 595B, and other color systems.

Trainee \$18.00 ISBN 0-13-874868-3
Instructor \$18.00 ISBN 0-13-874876-4

07305 Decorative (Faux) Finishes

(22.5 Hours)

Describes the techniques for creating glazing, antiquing, stippling, mottling, gilding, marbling, and graining decorative finishes.

Trainee \$18.00 ISBN 0-13-875121-8
Instructor \$18.00 ISBN 0-13-875139-0

07306 Wallcovering (40 Hours)

Covers the wallcovering process from start to finish. Includes equipment and materials, estimating methods, surface preparation, adhesives and installation, and failures and remedies.

Trainee \$18.00 ISBN 0-13-874926-4
Instructor \$18.00 ISBN 0-13-874934-5

07307 Graphics (12.5 Hours)

Covers types of graphics and their uses, methods of transferring graphic patterns to a surface, building code regulations, and other factors in the use of graphics.

Trainee \$18.00 ISBN 0-13-874967-1
Instructor \$18.00 ISBN 0-13-874975-2

07308 Texturing (10 Hours)

Covers the characteristics of various texturing materials, surface preparation procedures, and techniques for producing different patterns.

Trainee \$18.00 ISBN 0-13-875063-7
Instructor \$18.00 ISBN 0-13-875071-8

07309 Spraying with Special Devices

(20 Hours)

Covers the design and function of texture, cold roof coating, electrostatic, and plural component spraying equipment. Includes procedures for the safe operation and maintenance of typical equipment.

Trainee \$18.00 ISBN 0-13-874884-5
Instructor \$18.00 ISBN 0-13-874892-6

L4 PAINTING - INDUSTRIAL

LEVEL 4

Curriculum Notes

- 152.5 Hours
- Published: 1998

PAPERBACK

Trainee Guide: \$88 ISBN 0-13-910100-4
Instructor's Guide: \$88 ISBN 0-13-910126-8

BINDER

Trainee Guide: \$93 ISBN 0-13-910118-7
Instructor's Guide: \$93 ISBN 0-13-910134-9

Painting

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

07401 Safety (10 Hours)

Provides a comprehensive overview of the safety rules and precautions for working on construction sites, with a focus on the industrial painting trade and applications.

Trainee \$18.00 **ISBN 0-13-998709-6**
 Instructor \$18.00 **ISBN 0-13-998816-5**

07402 Ladders, Scaffolds, Lifts, and Fall Protection (15 Hours)

Describes methods for erecting, using, and maintaining ladders, scaffolds, and lifts. Covers fall protection equipment and safety practices used when working on ladders, scaffolds, and lifts.

Trainee \$18.00 **ISBN 0-13-998717-7**
 Instructor \$18.00 **ISBN 0-13-998824-6**

07403 Containment/Ventilation (7.5 Hours)

Introduces the methods used for limiting dust, debris, hazardous material, etc., from contaminating the environment and injuring people. Bases content on the monitoring components and methods recommended in *SSPC-Guide 6 (CON)*. Covers ventilation methods used for the control of emissions released to the atmosphere and to protect the worker within a containment enclosure.

Trainee \$18.00 **ISBN 0-13-998725-8**
 Instructor \$18.00 **ISBN 0-13-998832-7**

07404 Surface Preparation One (15 Hours)

Covers the tools, materials, and methods used for cleaning and preparing surfaces/substrates by solvent cleaning, hand tool cleaning, and power tool cleaning methods. Bases content on the methods and procedures specified by the following SSPC/NACE standards: *SSPC-SPI*, *SSPC-SP2*, *SSPC-SP3*, *SSPC-SPI1*, and *SSPC-SPI3/NACE 6*.

Trainee \$18.00 **ISBN 0-13-998733-9**
 Instructor \$18.00 **ISBN 0-13-998840-8**

07405 Surface Preparation Two (20 Hours)

Covers the tools, materials, and methods used for cleaning and preparing surfaces/substrates using various types of abrasive blasting equipment. Bases content on the methods and procedures specified by the following SSPC/NACE standards: *SSPC-SP5/NACE 1*, *SSPC-SPI0/NACE 2*, *SSPC-SP6/NACE 3*, *SSPC-SP7/NACE 4*.

Trainee \$18.00 **ISBN 0-13-998741-X**
 Instructor \$18.00 **ISBN 0-13-998857-2**

07406 Surface Preparation Three (7.5 Hours)

Covers the tools, materials, and methods used for cleaning and preparing surfaces/substrates by chemical stripping, pickling, high-pressure water-jetting, and ultra high-pressure water jetting. Bases content on the methods and procedures specified by the following SSPC/NACE standards: *SSPC-SP8* and *SSPC-SPI2/NACE 5*.

Trainee \$18.00 **ISBN 0-13-998758-4**
 Instructor \$18.00 **ISBN 0-13-998865-3**

07407 Industrial Coatings (12.5 Hours)

Covers the basic ingredients and film-forming processes common to all paints and coatings and describes paint systems and the different functional categories of paints and coatings. Introduces the unique properties, safety and health considerations, and surface preparation and application of high-performance coatings used to protect substrates for industrial applications.

Trainee \$18.00 **ISBN 0-13-998766-5**
 Instructor \$18.00 **ISBN 0-13-998873-4**

07408 Coatings Applications and Equipment (25 Hours)

Covers the equipment and methods used to apply coatings by the following methods: brushes and rollers, conventional sprayers, airless and air-assisted sprayers, high-volume low pressure (HVLP) sprayers, electrostatic sprayers, plural component proportioning equipment, wire flame and wire arc sprayers, and dry powder coating application process.

Trainee \$18.00 **ISBN 0-13-998774-6**
 Instructor \$18.00 **ISBN 0-13-998881-5**

07409 Quality Inspections (15 Hours)

Introduces the various formal quality control tasks and procedures used to govern the quality and acceptance of work performed by those in the industrial painting industry. Also describes the methods, equipment, and test instruments used to perform tasks in accordance with the requirements of the various ASTM and SSPC/NACE standards governing quality control and quality assurance.

Trainee \$18.00 **ISBN 0-13-998782-7**
 Instructor \$18.00 **ISBN 0-13-998899-8**

07410 Coatings Failures and Analysis (7.5 Hours)

Covers how to recognize failures of paints/coatings on exterior and interior substrates, causes of these failures, and their remedies. Focuses special attention on the nature of the substrates, application procedures, and surface preparation.

Trainee \$18.00 **ISBN 0-13-998790-8**
 Instructor \$18.00 **ISBN 0-13-998907-2**

07411 Specialty Materials (7.5 Hours)

Describes the characteristics and types of sealants and fillers commonly used in industrial application. Covers sealers and putties used in conjunction with tank and vessel reinforced lining systems, as well as fire resistant and fire retardant sealing materials. Gives guidelines for selecting the materials covered, along with the tools and methods used for applying them on steel, concrete, and other construction substrates.

Trainee \$18.00 **ISBN 0-13-998808-4**
 Instructor \$18.00 **ISBN 0-13-998915-3**



Product Supplements	
Computerized Testing Software ISBN 0-13-012559-8	\$30
Transparency Masters ISBN 0-13-012554-7	\$30

Pipefitting

L1 PIPEFITTING



LEVEL 1

Curriculum Notes

- Total Hours: 150 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1992 Revised: 2006, Third Edition
- Includes full-color insert
- A Spanish translation is under way and will be available Fall 2008. Only the Trainee Guide, tests and transparency masters will be translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests.

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-227310-1**
 Annotated Instructor's Guide: \$60 **ISBN 0-13-227312-8**

SPANISH VERSION (Paperback)

Trainee Guide: \$60 **ISBN 0-13-605757-8**
 Instructor's Guide: \$60 **ISBN 0-13-605758-6**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

08101-06 Orientation to the Trade (5 Hours)

Provides a comprehensive overview of work performed by the pipefitter, as well as pipefitter responsibilities, career opportunities, and safety principles associated with the pipefitting trade.

Trainee \$18.00 **ISBN 0-13-229020-0**
 Instructor \$18.00 **ISBN 0-13-229027-8**

08102-06 Pipefitting Hand Tools (20 Hours)

Covers general hand tool safety as well as procedures for selecting, inspecting, using, and maintaining hand tools used by pipefitters. Coverage includes pipe wrenches, pipe stands, pipe vises, levels, pipe fabrication tools, pipe bending tools, and pipe joining tools.

Trainee \$18.00 **ISBN 0-13-229021-9**
 Instructor \$18.00 **ISBN 0-13-229028-6**

08103-06 Pipefitting Power Tools (15 Hours)

Covers general power tool safety as well as procedures for selecting, inspecting, using, and maintaining power tools used by pipefitters. Provides guidelines for using electrical and pneumatic tools, including pipe threading machines.

Trainee \$18.00 **ISBN 0-13-229023-5**
 Instructor \$18.00 **ISBN 0-13-229029-4**

08104-06 Oxyfuel Cutting (17.5 Hours)

Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and provides instructions for setting up, lighting, and using the equipment. Includes straight line cutting, piercing, beveling, washing, and gouging.

Trainee \$18.00 **ISBN 0-13-229024-3**
 Instructor \$18.00 **ISBN 0-13-229031-6**

08105-06 Ladders and Scaffolds (10 Hours)

Covers hazards and safety procedures governing the use of stepladders, extension ladders, fixed scaffolds, and rolling scaffolds. Includes general procedures for scaffold assembly and use.

Trainee \$18.00 **ISBN 0-13-229025-1**
 Instructor \$18.00 **ISBN 0-13-229032-4**

08106-06 Motorized Equipment (10 Hours)

Explains the safety factors, operator maintenance, and operating procedures associated with motorized equipment used on job sites, including electrical generators, air compressors, aerial lifts, pumps, forklifts, and hydraulic cranes.

Trainee \$18.00 **ISBN 0-13-229026-X**
 Instructor \$18.00 **ISBN 0-13-229033-2**

Product Supplements	
Computerized Testing Software ISBN 0-13-229130-4	\$30
Transparency Masters ISBN 0-13-229151-7	\$25
NEW! PowerPoint® Presentation Slides (in color) ISBN 0-13-602528-5	\$40

L2 PIPEFITTING

LEVEL 2

Curriculum Notes

- 162.5 Hours
- Published: 1993 Revised: 2006, Third Edition

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-227314-4**
 Annotated Instructor's Guide: \$88 **ISBN 0-13-227317-9**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

08201-06 Piping Systems (5 Hours)

Introduces chemical, compressed air, fuel oil, steam, and water systems. Explains how to identify piping systems according to color codes.

Trainee \$18.00 **ISBN 0-13-613595-1**
 Instructor \$18.00 **ISBN 0-13-613606-0**

08202-06 Drawings and Detail Sheets (15 Hours)

Introduces the trainee to plot plans, structural drawings, elevation drawings, as-built drawings, equipment arrangement drawings, P&IDs, isometric drawings, spool sheets, and detail sheets.

Trainee \$18.00 **ISBN 0-13-613596-X**
 Instructor \$18.00 **ISBN 0-13-613607-9**

08203-06 Identifying and Installing Valves (20 Hours)

Identifies and provides installation methods for different types of valves. Also covers valve storage and handling.

Trainee \$18.00 **ISBN 0-13-613598-6**
 Instructor \$18.00 **ISBN 0-13-613608-7**

08204-06 Pipefitting Trade Math (15 Hours)

Explains how to use ratios and proportions, solve basic algebra, area, volume, and circumference problems, and solve for right triangles using the Pythagorean theorem.

Trainee \$18.00 **ISBN 0-13-613599-4**
 Instructor \$18.00 **ISBN 0-13-613609-5**

08205-06 Threaded Pipe Fabrication (15 Hours)

Describes the materials used in threaded piping systems. Explains how to determine pipe lengths between threaded pipe fittings, prepare the pipe and fittings for fit-up, and assemble the piping system.

Trainee \$18.00 **ISBN 0-13-613600-1**
 Instructor \$18.00 **ISBN 0-13-613610-9**

08206-06 Socket Weld Pipe Fabrication (25 Hours)

Describes the materials used in socket weld piping systems. Explains how to determine pipe lengths between socket weld fittings, prepare the pipe and fittings for fit-up, and fabricate socket weld fittings.

Trainee \$18.00 **ISBN 0-13-613601-X**
 Instructor \$18.00 **ISBN 0-13-613611-7**

08207-06 Butt Weld Pipe Fabrication (37.5 Hours)

Describes the materials used in butt weld piping systems. Explains how to determine pipe lengths between butt weld fittings, prepare the pipe and fittings for fit-up, and fabricate butt weld fittings. Also describes how to select and install backing rings, fabricate channel iron welding jigs, and use and care for welding clamps.

Trainee \$18.00 **ISBN 0-13-613602-8**
 Instructor \$18.00 **ISBN 0-13-613612-5**

08208-06 Excavations (10 Hours)

Explains the use of shoring materials per OSHA standards and covers shoring systems, installing a hydraulic vertical shore, determining the overall fall of a sewer line, setting the grade and elevation of a trench, and backfilling.

Trainee \$18.00 **ISBN 0-13-613603-6**
 Instructor \$18.00 **ISBN 0-13-613614-1**



Pipefitting

08209-06 Underground Pipe Installation (20 Hours)

Explains pipe installation procedures and guidelines, including the procedures for cast iron, ductile iron, concrete, carbon steel, fiberglass, and thermoplastic pipe. Includes an introduction to horizontal directional drilling for pipe installation.

Trainee \$18.00 **ISBN 0-13-613604-4**
 Instructor \$18.00 **ISBN 0-13-613580-3**

Product Supplements	
Computerized Testing Software ISBN 0-13-229131-2	\$30
Transparency Masters ISBN 0-13-229152-5	\$25
NEW! PowerPoint® Presentation Slides (in color) ISBN 0-13-602623-0	\$40

L3 PIPEFITTING

LEVEL 3

Curriculum Notes

- 132.5 Hours
- Published: 1993 Revised: 2007, Third Edition

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-227284-9**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-227286-5**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

08301-07 Rigging Equipment (10 Hours)

Describes the use and inspection of basic equipment and hardware used in rigging, including slings, wire rope, chains, and attaching hardware. Explains sling angles. Describes the use of tuggers, jacks, hoists, and come-alongs.

Trainee \$18.00 **ISBN 0-13-614662-7**
 Instructor \$18.00 **ISBN 0-13-614636-8**

08302-07 Rigging Practices (10 Hours)

Describes basic rigging and crane hazards and related safety procedures. Provides an overview of personnel lifting and lift planning. Introduces crane load charts and load balancing. Includes instructions for rigging and lifting pipe.

Trainee \$18.00 **ISBN 0-13-614663-5**
 Instructor \$18.00 **ISBN 0-13-614638-4**

08303-07 Standards and Specifications (7.5 Hours)

Explains how to read and interpret pipefitting standards, codes, and specifications. Describes how to identify pipe and components according to specifications.

Trainee \$18.00 **ISBN 0-13-614664-3**
 Instructor \$18.00 **ISBN 0-13-614674-0**

08304-07 Advanced Trade Math (20 Hours)

Discusses the use of equivalent and conversion tables. Explains how to use right angle trigonometry to calculate take-outs.

Trainee \$18.00 **ISBN 0-13-614630-9**
 Instructor \$18.00 **ISBN 0-13-614675-9**

08305-07 Motorized Equipment II (10 Hours)

Covers the applications and safety requirements of drain cleaners, manlifts, and cable lifts.

Trainee \$18.00 **ISBN 0-13-614631-7**
 Instructor \$18.00 **ISBN 0-13-614676-7**

08306-07 Introduction to Aboveground Pipe Installation (20 Hours)

Identifies various types of pipe, flanges, gaskets, and bolts. Includes step-by-step procedures for installing pipe sleeves and floor penetrations.

Trainee \$18.00 **ISBN 0-13-614632-5**
 Instructor \$18.00 **ISBN 0-13-614677-5**

08307-07 Field Routing and Vessel Trim (10 Hours)

Explains how to secure the work area and determine field run specifications, load weights for erection equipment, and support needs. Covers how to erect vessel trim.

Trainee \$18.00 **ISBN 0-13-614633-3**
 Instructor \$18.00 **ISBN 0-13-614679-1**

08308-07 Pipe Hangers and Supports (25 Hours)

Explains how to identify, select, and install pipe hangers and supports, including spring can supports.

Trainee \$18.00 **ISBN 0-13-614634-1**
 Instructor \$18.00 **ISBN 0-13-614680-5**

08309-07 Testing Piping Systems and Equipment (20 Hours)

Explains how to perform pretests, service flow tests, head pressure tests, hydrostatic tests, and steam blow tests.

Trainee \$18.00 **ISBN 0-13-614635-X**
 Instructor \$18.00 **ISBN 0-13-614681-3**

Product Supplements

Computerized Testing Software ISBN 0-13-229132-0	\$30
Transparency Masters ISBN 0-13-229153-3	\$25
NEW! PowerPoint® Presentation Slides (in color) (planned for Fall 2008: visit www.nccer.org for ISBN)	

L4 PIPEFITTING

LEVEL 4

REVISED!

Curriculum Notes

- Total Hours: 192.5
- Published: 1993 Revised: 2007, Third Edition

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-614429-2**
 Annotated
 Instructor's Guide: \$88 **ISBN 0-13-614430-6**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

08401-07 Advanced Blueprint Reading (50 Hours)

Explains how to derive necessary construction information from P&IDs, general arrangement drawings, ISOs, and spool sheets. Includes nine 11 x 17 blueprints.

Trainee \$18.00 **ISBN 0-13-604786-6**
 Instructor \$18.00 **ISBN 0-13-604762-9**

08402-07 Advanced Pipe Fabrication (50 Hours)

Covers the skills needed to layout and fabricate mitered bends, laterals, wyes, and ninety-degree intersections with tables of ordinates or by calculating ordinates with a calculator. These skills are necessary when specialty bends and intersections are required.

Trainee \$18.00 **ISBN 0-13-604787-4**
 Instructor \$18.00 **ISBN 0-13-604763-7**

08403-07 Stress Relieving and Aligning (15 Hours)

Teaches the nature of inaccuracy, misalignment and pipe strain, and addresses the methods of correcting them. Includes methods of effective communication to reduce these errors.

Trainee \$18.00 **ISBN 0-13-604788-2**
 Instructor \$18.00 **ISBN 0-13-604764-5**

08404-07 Steam Traps (15 Hours)

Describes the types of traps, their functions and advantages, and the basic methods of troubleshooting steam traps.

Trainee \$18.00 **ISBN 0-13-604789-0**
 Instructor \$18.00 **ISBN 0-13-604765-3**

08405-07 In-Line Specialties (10 Hours)

Describes the various devices that appear in pipelines, including bleed rings, ball and expansion joints, steam traps, drip legs, desuperheaters, and measuring devices for temperature, level, flow rate, and pressure.

Trainee \$18.00 **ISBN 0-13-604790-4**
 Instructor \$18.00 **ISBN 0-13-604766-1**

Pipefitting

08406-07 Special Piping (25 Hours)

Introduces copper and plastic pipe and tubing. Addresses brazing, soldering, and the differences between the two methods. Also describes the methods of assembling plastic pipe and tubing, compression and flared fittings, and joining methods for grooved and compression formed fittings.

Trainee \$18.00 **ISBN 0-13-604791-2**
 Instructor \$18.00 **ISBN 0-13-604767-X**

08407-07 Hot Taps (10 Hours)

Teaches the hot tap technique for attaching fittings to the pipeline. Includes line stopping, freeze stopping, and adding connections to the line.

Trainee \$18.00 **ISBN 0-13-604792-0**
 Instructor \$18.00 **ISBN 0-13-604768-8**

08408-07 Maintaining Valves (10 Hours)

Discusses the safest ways to maintain valves. Teaches how to replace packing and o-rings, as well as how to open and close a valve's bonnet. Introduces general trouble shooting and maintenance of several types of valves.

Trainee \$18.00 **ISBN 0-13-604794-7**
 Instructor \$18.00 **ISBN 0-13-604804-8**

08409-07 Introduction to Supervisory Roles (7.5 Hours)

Provides an introductory explanation of cultural and gender differences in work scenarios. Covers the basic requirements for movement into supervisory roles, and legal and ethical issues of supervisory roles.

Trainee \$18.00 **ISBN 0-13-604761-0**
 Instructor \$18.00 **ISBN 0-13-604805-6**

Product Supplements	
Computerized Testing Software ISBN 0-13-614782-8	\$30
Transparency Masters ISBN 0-13-614798-4	\$20
NEW! PowerPoint® Presentation Slides (in color) (planned for Fall 2008: visit www.nccer.org for ISBN)	

Pipelayer

L1 PIPELAYER
LEVEL 1
Curriculum Notes
<ul style="list-style-type: none"> Total Hours: 185 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information). Published: 1999
PAPERBACK
Trainee Guide: \$60 ISBN 0-13-014258-1
Instructor's Guide: \$60 ISBN 0-13-014250-6

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

24101 Job Site Safety (17.5 Hours)

Describes the appropriate personal protective equipment most commonly used on the job site and addresses the impact of housekeeping on safety and project completion. Explains the most common indicators of existing utilities and recommends safe methods for locating and working around existing utilities.

Trainee \$18.00 **ISBN 0-13-015304-4**
 Instructor \$18.00 **ISBN 0-13-015315-X**

24102 Tools and Equipment (22.5 Hours)

Describes the safe use, care, and maintenance of the most common pipelayer hand and power tools. Discusses methods for operating and maintaining dewatering equipment, generators, and compressors. Contains an introduction to drilling and tapping machines.

Trainee \$18.00 **ISBN 0-13-015305-2**
 Instructor \$18.00 **ISBN 0-13-015316-8**

24103 Rigging and Delivering Pipe and Associated Structures (7.5 Hours)

Describes the most common methods for receipt inspection, storage, and delivery to the trench of PVC, ductile iron, corrugated steel, and concrete pipe. Identifies the hand signals used by pipelayers when rigging pipe, and piping components, including manholes and appurtenances.

Trainee \$18.00 **ISBN 0-13-015307-9**
 Instructor \$18.00 **ISBN 0-13-015317-6**

24104 Cutting Pipe (12.5 Hours)

Discusses the safest, most practical methods for cutting common pipe materials. Also describes common pipe materials and standard sizes for thermoplastic, concrete, ductile iron, and corrugated steel pipe.

Trainee \$18.00 **ISBN 0-13-015308-7**
 Instructor \$18.00 **ISBN 0-13-015318-4**

24105 Gaskets, Joints, and Fittings (20 Hours)

Describes the most common methods for joining PVC, ductile iron, and concrete pipe, including O-ring pipe, slip joints, mechanical joints, and restraint joints. Discusses common methods for joining pipe to pipe, pipe to appurtenances, and pipe to manhole connections, including transition couplings.

Trainee \$18.00 **ISBN 0-13-015309-5**
 Instructor \$18.00 **ISBN 0-13-015319-2**

24106 Introduction to Elevations (5 Hours)

Discusses the use, care, and maintenance of the optical level, transit, and the pipe laser. Contains a brief introduction to elevations as it relates to the setup of these instruments. Describes common causes and solutions to laser problems in the field.

Trainee \$18.00 **ISBN 0-13-015300-1**
 Instructor \$18.00 **ISBN 0-13-015310-9**

24107 Trench Safety (7.5 Hours)

Discusses soil behavior as it relates to trench failures, including common indications of an unstable trench. Introduces typical shoring, shielding, and sloping methods. Identifies characteristics that may make a trench a confined space and describes the safety measures needed to work in the trench.

Trainee \$18.00 **ISBN 0-13-015311-7**
 Instructor \$18.00 **ISBN 0-13-015321-4**

24108 Foundation Stabilization, Bedding, and Dewatering (7.5 Hours)

Discusses common methods for preparing the trench for pipe installation, including stabilization, bedding, and initial backfill. Describes effective methods for dewatering a trench and includes a section on troubleshooting dewatering equipment.

Trainee \$18.00 **ISBN 0-13-015312-5**
 Instructor \$18.00 **ISBN 0-13-015323-0**

24109 Testing Pipe (12.5 Hours)

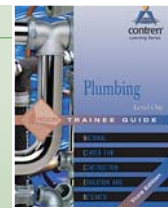
Discusses methods for preparing pressure and gravity systems for testing, including cleaning and inspecting pipe systems. Describes methods for testing pressure and gravity systems, including vacuum testing of concrete manholes.

Trainee \$18.00 **ISBN 0-13-015313-3**
 Instructor \$18.00 **ISBN 0-13-015324-9**

Product Supplements	
Transparency Masters ISBN 0-13-015505-5	\$20



Plumbing

L1 PLUMBING**LEVEL 1****Curriculum Notes**

- Total Hours: 195 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1992 Revised: 2005, Third Edition
- All Trainee Guide formats including individual modules are in full-color.
- Contren Connect online is available with this title. See below for ordering information.

PAPERBACKTrainee Guide: \$60 **ISBN 0-13-109178-6**Annotated Instructor's Guide: \$60 **ISBN 0-13-109180-8****CONTREN CONNECT**Trainee Guide Paperback + Access Code Package: \$85 **ISBN 0-13-239129-5**AIG Paperback + Access Code Package: \$160 **ISBN 0-13-239130-9**Access Code ONLY for Trainee Guide: \$60 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605698-9**Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605699-7****MODULES**

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

02101-05 Introduction to the Plumbing Profession (5 Hours)

Introduces trainees to the many career options available in today's plumbing profession. Provides a history of plumbing and also discusses the current technology, industries, and associations that make up the modern plumbing profession. Also reviews human relations and safety skills.

Trainee \$18.00 **ISBN 0-13-160036-2**Instructor \$18.00 **ISBN 0-13-160052-4****02102-05 Plumbing Safety (20 Hours)**

Discusses the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. Reviews the types and proper use of personal protective equipment (PPE). Instructs trainees in the use of critical safety information conveyed in hazard communication (HazCom), safety signs, signals, lockout/tagout, and emergency response. Covers confined-space safety, and reviews safety issues related to hand and power tools.

Trainee \$18.00 **ISBN 0-13-160038-9**Instructor \$18.00 **ISBN 0-13-160053-2****02103-05 Plumbing Tools (7.5 Hours)**

Instructs trainees in the care and use of the different types of hand and power tools they will use on the job. Gives trainees the information they need to select the appropriate tools for different tasks, and reviews tool maintenance and safety issues.

Trainee \$18.00 **ISBN 0-13-160039-7**Instructor \$18.00 **ISBN 0-13-160054-0****02104-05 Introduction to Plumbing Math (7.5 Hours)**

Reviews basic math concepts, such as whole numbers, fractions, decimals, and squares, and demonstrates how they apply to on-the-job situations. Teaches trainees how to measure pipe using fitting tables and framing squares and how to calculate 45-degree offsets.

Trainee \$18.00 **ISBN 0-13-160040-0**Instructor \$18.00 **ISBN 0-13-160055-9****02105-05 Introduction to Plumbing Drawings (12.5 Hours)**

Introduces trainees to the different types of plumbing drawings they will encounter on the job and discusses how to interpret and apply them when laying out and installing plumbing systems. Discusses the symbols used in plumbing and mechanical drawings and reviews isometric, oblique, orthographic, as well as schematic drawings. Requires trainees to render plumbing drawings and to recognize how code requirements apply to plumbing drawings.

Trainee \$18.00 **ISBN 0-13-160041-9**Instructor \$18.00 **ISBN 0-13-160056-7****02106-05 Plastic Pipe and Fittings (10 Hours)**

Introduces trainees to the different types of plastic pipe and fittings used in plumbing applications, including ABS, PVC, CPVC, PE, PEX, and PB. Describes how to measure, cut, join, and support plastic pipe according to manufacturer's instructions and applicable codes. Also discusses pressure testing of plastic pipe once installed.

Trainee \$18.00 **ISBN 0-13-160042-7**Instructor \$18.00 **ISBN 0-13-160057-5****02107-05 Copper Pipe and Fittings (10 Hours)**

Discusses sizing, labeling, and applications of copper pipe and fittings and reviews the types of valves that can be used on copper pipe systems. Explains proper methods for cutting, joining, and installing copper pipe. Also addresses insulation, pressure testing, seismic codes, and handling and storage requirements.

Trainee \$18.00 **ISBN 0-13-160043-5**Instructor \$18.00 **ISBN 0-13-160058-3****02108-05 Cast-Iron Pipe and Fittings (12.5 Hours)**

Introduces trainees to hub-and-spigot and no-hub cast-iron pipe and fittings and their applications in DWV systems. Reviews material properties, storage and handling requirements, and fittings and valves. Covers joining methods, installation, and testing.

Trainee \$18.00 **ISBN 0-13-160044-3**Instructor \$18.00 **ISBN 0-13-160059-1****02109-05 Carbon Steel Pipe and Fittings (10 Hours)**

Discusses threading, labeling, and sizing of carbon steel pipe and reviews the differences between domestic and imported pipe. Also covers the proper techniques for measuring, cutting, threading, joining, and hanging carbon steel pipe.

Trainee \$18.00 **ISBN 0-13-160046-X**Instructor \$18.00 **ISBN 0-13-160060-5****02110-05 Corrugated Stainless Steel Tubing (2.5 Hours)**

Reviews flexible plastic-coated steel tubing. Discusses piping system components and the various connection and installation options. Also reviews applicable safety and code requirements.

Trainee \$18.00 **ISBN 0-13-160047-8**Instructor \$18.00 **ISBN 0-13-160061-3****02111-05 Fixtures and Faucets (5 Hours)**

Discusses the proper applications of code-approved fixtures and faucets in plumbing installations. Reviews the different types of fixtures and faucets and the materials used in them. Also covers storage, handling, and code requirements.

Trainee \$18.00 **ISBN 0-13-160048-6**Instructor \$18.00 **ISBN 0-13-160062-1****02112-05 Introduction to Drain, Waste, and Vent (DWV) Systems (10 Hours)**

Explains how DWV systems remove waste safely and effectively. Discusses how system components, such as pipe, drains, traps, and vents, work. Reviews drain and vent sizing, grade, and waste treatment. Also discusses how building sewers and sewer drains connect the DWV system to the public sewer system.

Trainee \$18.00 **ISBN 0-13-160049-4**Instructor \$18.00 **ISBN 0-13-160063-X**

Plumbing

02113-05 Introduction to Water Distribution Systems (10 Hours)

Identifies the major components of water distribution systems and describes their functions. Reviews water sources and treatment methods and covers supply and distribution for the different types of systems that trainees will install on the job.

Trainee \$18.00 **ISBN 0-13-160050-8**

Instructor \$18.00 **ISBN 0-13-160064-8**

Product Supplements	
Computerized Testing Software ISBN 0-13-109915-9	\$30
Transparency Masters ISBN 0-13-109902-7	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-160003-6	\$40
National Construction Career Test available with this title (see p. 7 for more information)	

L2 PLUMBING

LEVEL 2

Curriculum Notes

- 165 Hours
- Published: 1992 Revised: 2005, Third Edition
- Includes full-color insert
- Contren Connect online is available with this title. See below for ordering information.

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-109183-2**

Annotated Instructor's Guide: \$88 **ISBN 0-13-109185-9**

BINDER

Trainee Guide: \$93 **ISBN 0-13-109184-0**

Annotated Instructor's Guide: \$93 **ISBN 0-13-109186-7**

CONTREN CONNECT

Trainee Guide Paperback
+ Access Code Package: \$113 **ISBN 0-13-239131-7**

AIG Paperback
+ Access Code Package: \$188 **ISBN 0-13-239132-5**

Access Code ONLY for Trainee Guide: \$88
(must be ordered electronically via OASIS;
does not include print book) **ISBN 0-13-605701-2**

Access Code ONLY for AIG: \$100
(must be ordered electronically via OASIS;
does not include print book) **ISBN 0-13-605702-0**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

02201-05 Plumbing Math Two (15 Hours)

Explains the Pythagorean theorem and reviews methods for finding angles. Discusses the techniques used to calculate simple and rolling offsets, as well as offsets on parallel runs of pipe.

Trainee \$18.00 **ISBN 0-13-168302-0**

Instructor \$18.00 **ISBN 0-13-168316-0**

02202-05 Reading Commercial Drawings (20 Hours)

Teaches trainees how to interpret and use civil, architectural, structural, mechanical, plumbing, and electrical drawings when installing plumbing systems. Covers how to create and use isometric drawings, material takeoffs, and approved submittal data.

Trainee \$18.00 **ISBN 0-13-168304-7**

Instructor \$18.00 **ISBN 0-13-168317-9**

02203-05 Hangers, Supports, Structural Penetrations, and Fire Stopping (10 Hours)

Introduces trainees to methods for attaching and running DWV and water supply piping in relation to structural elements, including pipe hangers and supports, modifications to structural members, and fire-stopping.

Trainee \$18.00 **ISBN 0-13-168305-5**

Instructor \$18.00 **ISBN 0-13-168318-7**

02204-05 Installing and Testing DWV Piping (25 Hours)

Explains how to locate, install, connect, and test a complete drain, waste, and vent (DWV) system.

Trainee \$18.00 **ISBN 0-13-168306-3**

Instructor \$18.00 **ISBN 0-13-168319-5**

02205-05 Installing Roof, Floor, and Area Drains (5 Hours)

Covers the proper techniques for locating, installing, and connecting roof, floor, and area drains according to code. Also discusses waterproof membranes and flashing, drain components, and proper drain applications.

Trainee \$18.00 **ISBN 0-13-168307-1**

Instructor \$18.00 **ISBN 0-13-168320-9**

02206-05 Types of Valves (5 Hours)

Reviews the many types of valves, their components, and valve applications. Also covers valve repair and replacement.

Trainee \$18.00 **ISBN 0-13-168308-X**

Instructor \$18.00 **ISBN 0-13-168321-7**

02207-05 Installing and Testing Water Supply Piping (20 Hours)

Explores the proper techniques for locating, installing, and testing complete water supply systems, including piping, meters, water heaters, water softeners, and hose bibbs. Reviews common code requirements for water supply systems.

Trainee \$18.00 **ISBN 0-13-168309-8**

Instructor \$18.00 **ISBN 0-13-168322-5**

02208-05 Installing Fixtures, Valves, and Faucets (20 Hours)

Covers the installation of basic plumbing fixtures, including bathtubs, shower stalls, lavatories, sinks, water closets, and urinals. Also reviews the installation of associated valves, faucets, and components.

Trainee \$18.00 **ISBN 0-13-168310-1**

Instructor \$18.00 **ISBN 0-13-168323-3**

02209-05 Introduction to Electricity (15 Hours)

Introduces trainees to the principles of electricity, including voltage, current, resistance, and power. Includes important electrical formulas, circuitry, and common plumbing-related electrical applications.

Trainee \$18.00 **ISBN 0-13-168312-8**

Instructor \$18.00 **ISBN 0-13-168324-1**

02210-05 Installing Water Heaters (5 Hours)

Discusses gas-fired, electric, solar, instantaneous, and indirect water heaters, components, and applications. Reviews proper installation and testing techniques and covers the latest federal guidelines that apply to water heaters.

Trainee \$18.00 **ISBN 0-13-168313-6**

Instructor \$18.00 **ISBN 0-13-168325-X**

02211-05 Fuel Gas Systems (20 Hours)

Introduces the techniques for safe handling of natural gas, liquefied petroleum gas, and fuel oil. Reviews fuel gas and fuel oil applications, systems installation, and testing.

Trainee \$18.00 **ISBN 0-13-168314-4**

Instructor \$18.00 **ISBN 0-13-168326-8**

02212-05 Servicing of Fixtures, Valves, and Faucets (5 Hours)

Covers the troubleshooting and repair of fixtures, valves, and faucets in accordance with code and safety guidelines.

Trainee \$18.00 **ISBN 0-13-168315-2**

Instructor \$18.00 **ISBN 0-13-168327-6**

Product Supplements	
Computerized Testing Software ISBN 0-13-109916-7	\$30
Transparency Masters ISBN 0-13-109903-5	\$25
NEW! PowerPoint® Presentation Slides (in color) ISBN 0-13-602612-5	\$40



Plumbing

L3 PLUMBING**LEVEL 3****Curriculum Notes**

- 145 Hours
- Published: 1993 Revised: 2006, Third Edition
- Contren Connect online is available with this title. See below for ordering information.

PAPERBACKTrainee Guide: \$88 **ISBN 0-13-227301-2**Annotated Instructor's Guide: \$88 **ISBN 0-13-227303-9****BINDER**Trainee Guide: \$93 **ISBN 0-13-227302-0**Annotated Instructor's Guide: \$93 **ISBN 0-13-227304-7****CONTREN CONNECT**Trainee Guide Paperback + Access Code Package: \$113 **ISBN 0-13-158725-0**AIG Paperback + Access Code Package: \$188 **ISBN 0-13-158729-3**Access Code ONLY for Trainee Guide: \$88 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605703-9**Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605704-7****MODULES**

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

02301-06 Applied Math (17.5 Hours)

Introduces trainees to math concepts they will use on the job, including weights and measures, area and volume, temperature, pressure, and force. Also reviews the six simple machines: inclined planes, levers, pulleys, wedges, screws, and wheels and axles.

Trainee \$18.00 **ISBN 0-13-229269-6**Instructor \$18.00 **ISBN 0-13-229278-5****02302-06 Sizing Water Supply Piping (17.5 Hours)**

Teaches techniques for sizing water supply systems, including calculating system requirements and demand, developed lengths, and pressure drops. Also reviews the factors that can reduce efficiency of water supply piping.

Trainee \$18.00 **ISBN 0-13-229270-X**Instructor \$18.00 **ISBN 0-13-229244-0****02303-06 Potable Water Treatment (15 Hours)**

Explains how to disinfect, filter, and soften water supply systems. Discusses how to troubleshoot water supply problems, flush out visible contaminants from a plumbing system, and disinfect a potable water plumbing system.

Trainee \$18.00 **ISBN 0-13-229271-8**Instructor \$18.00 **ISBN 0-13-229245-9****02304-06 Backflow Preventers (20 Hours)**

Introduces the different types of backflow prevention devices and discusses how they work, where they are used, and how they are installed.

Trainee \$18.00 **ISBN 0-13-229272-6**Instructor \$18.00 **ISBN 0-13-229247-5****02305-06 Types of Venting (20 Hours)**

Reviews the different types of vents that can be installed in a DWV system and how they work. Also teaches design and installation techniques.

Trainee \$18.00 **ISBN 0-13-229273-4**Instructor \$18.00 **ISBN 0-13-229248-3****02306-06 Sizing DWV and Storm Systems (20 Hours)**

Explains how to calculate drainage fixture units for waste systems. Reviews how to size drain, waste, and vent (DWV) systems; storm drainage systems; and roof storage and drainage systems.

Trainee \$18.00 **ISBN 0-13-229274-2**Instructor \$18.00 **ISBN 0-13-229249-1****02307-06 Sewage Pumps and Sump Pumps (17.5 Hours)**

Discusses the installation, diagnosis, and repair of pumps, controls, and sumps in sewage and storm water removal systems.

Trainee \$18.00 **ISBN 0-13-229275-0**Instructor \$18.00 **ISBN 0-13-229250-5****02308-06 Corrosive-Resistant Waste Piping (7.5 Hours)**

Discusses corrosive wastes and reviews related safety issues and hazard communications. Discusses how to determine when corrosive-resistant waste piping needs to be installed, as well as how to correctly select and properly connect different types of piping.

Trainee \$18.00 **ISBN 0-13-229276-9**Instructor \$18.00 **ISBN 0-13-229251-3****02309-06 Compressed Air (10 Hours)**

Explains the principles of compressed air systems and describes their components and accessories. Reviews installation and periodic servicing of air compressor systems.

Trainee \$18.00 **ISBN 0-13-229277-7**Instructor \$18.00 **ISBN 0-13-229252-1****Product Supplements****Computerized Testing Software**ISBN 0-13-229126-6 **\$30****Transparency Masters**ISBN 0-13-229149-5 **\$25****NEW! PowerPoint® Presentation Slides (in color)**ISBN 0-13-602613-3 **\$40****L4 PLUMBING****LEVEL 4****Curriculum Notes**

- 146 Hours
- Published: 1993 Revised: 2006, Third Edition
- Contren Connect online is available with this title. See below for ordering information.

PAPERBACKTrainee Guide: \$88 **ISBN 0-13-227305-5**Annotated Instructor's Guide: \$88 **ISBN 0-13-227308-X****BINDER**Trainee Guide: \$93 **ISBN 0-13-227306-3**Annotated Instructor's Guide: \$93 **ISBN 0-13-227309-8****CONTREN CONNECT**Trainee Guide Paperback + Access Code Package: \$113 **ISBN 0-13-158728-5**AIG Paperback + Access Code Package: \$188 **ISBN 0-13-158727-7**Access Code ONLY for Trainee Guide: \$88 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605670-9**Access Code ONLY for AIG: \$100 (must be ordered electronically via OASIS; does not include print book) **ISBN 0-13-605671-7****MODULES**

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

02401-06 Business Principles for Plumbers (15 Hours)

Introduces trainees to concepts and practices that are essential for competitive, successful plumbing businesses. Covers basic business accounting and project estimating, as well as techniques for cost control and task organization.

Trainee \$18.00 **ISBN 0-13-613767-9**Instructor \$18.00 **ISBN 0-13-613777-6**



Plumbing

02402-06 Introductory Skills for the Crew Leader (16 Hours)

Introduces trainees to the knowledge and skills required for team leadership. Covers practical information about today's construction industry; basic leadership skills; safety responsibilities of a supervisor; and a detailed survey of project control techniques.

Participant Guide: \$40.00 **ISBN 0-13-103593-2**
 Instructor's Guide: \$60.00 **ISBN 0-13-103594-0**

NOTE: This module is from the Contren® Management Learning Series (see page 98 for more information). Students may be eligible to receive craft and management transcripts from NCCER's National Registry.

02403-06 Water Pressure Booster and Recirculation Systems (17.5 Hours)

Builds on trainees' previous experience with pumps, storage tanks, controls, and pipes and fittings by teaching them to assemble those components into systems that boost water pressure and provide hot water.

Trainee \$18.00 **ISBN 0-13-613768-7**
 Instructor \$18.00 **ISBN 0-13-613778-4**

02404-06 Indirect and Special Waste (12.5 Hours)

Explains the code requirements and installation procedures for systems that protect against contamination from indirect and special wastes.

Trainee \$18.00 **ISBN 0-13-613769-5**
 Instructor \$18.00 **ISBN 0-13-613780-6**

02405-06 Hydronic and Solar Heating Systems (15 Hours)

Introduces the basic types of hydronic and solar heating systems and their components. Reviews hydronic and solar heating system layout and installation. Also discusses methods inhibiting corrosion in solar heating systems.

Trainee \$18.00 **ISBN 0-13-613770-9**
 Instructor \$18.00 **ISBN 0-13-613781-4**

02406-06 Codes (7.5 Hours)

Discusses the different types of codes used by plumbers across the country and explains how those codes are written, adopted, modified, and implemented.

Trainee \$18.00 **ISBN 0-13-613771-7**
 Instructor \$18.00 **ISBN 0-13-613782-2**

02407-06 Servicing Piping Systems, Fixtures, and Appliances (20 Hours)

Explains how to diagnose and repair water supply and drainage piping, water heaters, and other appliances and fixtures. Describes the effects of corrosion, freezing, and hard water on plumbing systems.

Trainee \$18.00 **ISBN 0-13-613772-5**
 Instructor \$18.00 **ISBN 0-13-613783-0**

02408-06 Private Water Supply Well Systems (10 Hours)

Explains the operation of pumps and well components. Reviews the qualities of good wells and how to assemble and disassemble pumps and components.

Trainee \$18.00 **ISBN 0-13-613773-3**
 Instructor \$18.00 **ISBN 0-13-613784-9**

02409-06 Private Waste Disposal Systems (10 Hours)

Describes the types of private sewage systems, discusses the maintenance and replacement of these systems, and explains how to determine the local code requirements for these systems. Covers percolation tests and sewage system planning and layout.

Trainee \$18.00 **ISBN 0-13-613774-1**
 Instructor \$18.00 **ISBN 0-13-613785-7**

02410-06 Swimming Pools and Hot Tubs (12.5 Hours)

Introduces trainees to plumbing systems in swimming pools, hot tubs, and spas. Trainees will learn how to install and troubleshoot water supply systems and drains.

Trainee \$18.00 **ISBN 0-13-613775-X**
 Instructor \$18.00 **ISBN 0-13-613786-5**

02411-06 Plumbing for Mobile Homes and Travel Trailers (10 Hours)

Describes the location and layout of plumbing systems for mobile home and travel trailer parks. Reviews how to design and lay out a system, how to connect water and sewer lines to a mobile home, and how to estimate materials and costs for the park.

Trainee \$18.00 **ISBN 0-13-613776-8**
 Instructor \$18.00 **ISBN 0-13-613788-1**

Product Supplements	
Computerized Testing Software ISBN 0-13-229128-2	\$30
Transparency Masters ISBN 0-13-229150-9	\$25
NEW! PowerPoint® Presentation Slides (in color) (planned for Fall 2008: visit www.nccer.org for ISBN)	

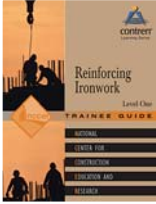




Reinforcing Ironwork

L1 REINFORCING IRONWORK

LEVEL 1



Curriculum Notes

- 117.5 Hours
- Published: 2005
- A Spanish translation is planned for 2008. Only the Trainee Guide, tests and transparency masters will be translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests. Ordering information below.

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-228220-8**
 Annotated Instructor's Guide: \$60 **ISBN 0-13-228221-6**

SPANISH VERSION (Paperback)

Trainee Guide: \$60 **ISBN 0-13-605737-3**
 Instructor's Guide: \$60 **ISBN 0-13-605738-1**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

39101-05 Concrete Reinforcement (40 Hours)

Instructs trainees on the selection and use of rebar, bar supports, and welded-wire fabric. It contains general procedures for cutting, bending, splicing, and tying rebar, and placement of steel in various types of footings, columns, walls, and slabs.

Trainee \$18.00 **ISBN 0-13-228987-3**
 Instructor \$18.00 **ISBN 0-13-228993-8**

39102-05 Concrete Reinforcement Safety (15 Hours)

Focuses on safety topics of particular concern to the reinforcing ironworker, including rebar-related hazards, fall protection, use of positioning devices, PPE, excavations, and lifting/carrying techniques.

Trainee \$18.00 **ISBN 0-13-228988-1**
 Instructor \$18.00 **ISBN 0-13-228994-6**

39103-05 Rigging Equipment (10 Hours)

Describes the use and inspection of basic equipment and hardware used in rigging, including slings, wire rope, chains, and attaching hardware such as shackles, eyebolts, and hooks, as well as rigging knots. Explains sling angles. Describes the use of tuggers, jacks, hoists, and come-alongs.

Trainee \$18.00 **ISBN 0-13-228989-X**
 Instructor \$18.00 **ISBN 0-13-228995-4**

39104-05 Rigging Practices (15 Hours)

Describes basic rigging and crane hazards and related safety procedures, provides an overview of personnel lifting and lift planning, and introduces crane load charts and load balancing. Includes instructions for rigging and lifting pipe.

Trainee \$18.00 **ISBN 0-13-228991-1**
 Instructor \$18.00 **ISBN 0-13-228996-2**

39105-05 Commercial Blueprints (20 Hours)

Provides instruction on the format and content of the various drawings typically found in a commercial drawings package.

Trainee \$18.00 **ISBN 0-13-228992-X**
 Instructor \$18.00 **ISBN 0-13-228997-0**

39106-05 Oxyfuel Cutting (17.5 Hours)

Explains the safety requirements for oxyfuel cutting. Identifies equipment and set-up requirements and explains how to light, adjust, and shut down oxyfuel equipment. Trainees will perform cutting techniques that include straight line, piercing, bevels, washing, and gouging.

Trainee \$18.00 **ISBN 0-13-229379-X**
 Instructor \$18.00 **ISBN 0-13-229380-3**

Product Supplements

Computerized Testing Software ISBN 0-13-229118-5	\$30
Transparency Masters ISBN 0-13-229110-X	\$25

L2 REINFORCING IRONWORK

LEVEL 2

Curriculum Notes

- 100 Hours
- Published: 2005

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-227294-6**
 Annotated Instructor's Guide: \$88 **ISBN 0-13-227295-4**

MODULES

Reinforcing Ironwork Level Two is comprised of existing modules from NCCER's *Carpentry* and *Ironworking* curriculum. If you'd like to order these modules individually, please refer to their listings with their originating crafts.

27204-01 Foundations and Flatwork (15 Hours)

27205-01 Concrete Forms (32.5 Hours)

27207-01 Handling and Placing Concrete (22.5 Hours)

27208-01 Manufactured Forms (22.5 Hours)

30116 Metal Decking (10 Hours)

MT101 Introductory Skills for the Crew Leader (16 Hours)

Product Supplements

Transparency Masters ISBN 0-13-229875-9	\$25
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Rigging Fundamentals

L1 RIGGING FUNDAMENTALS



Curriculum Notes

- 45 Hours
- Published: 2005
- A Spanish translation is planned for 2008. Only the Trainee Guide, tests and transparency masters will be translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests. Ordering information below.

PAPERBACK

Trainee Guide: \$44 **ISBN 0-13-227681-X**
 Annotated Instructor's Guide: \$44 **ISBN 0-13-227682-8**
 (includes Transparency Masters)

SPANISH VERSION (Paperback)

Trainee Guide: \$44 **ISBN 0-13-605711-X**
 Instructor's Guide: \$44 **ISBN 0-13-605712-8**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

00106-04 Basic Rigging (20 Hours)

Explains how ropes, chains, hoists, loaders, and cranes are used to move material and equipment from one location to another on a job site. Describes inspection techniques and load-handling safety practices. Also reviews American National Standards Institute (ANSI) hand signals.

Trainee \$18.00 **ISBN 0-13-160009-5**
 Instructor \$18.00 **ISBN 0-13-160018-4**

38101-05 Rigging Equipment (10 Hours)

Describes the use and inspection of basic equipment and hardware used in rigging, including slings, wire rope, chains, and attaching hardware such as shackles, eyebolts, and hooks, as well as rigging knots. Explains sling angles. Covers tuggers, jacks, hoists, and come-alongs.

Trainee \$18.00 **ISBN 0-13-227714-X**
 Instructor \$18.00 **ISBN 0-13-227716-6**

38102-05 Rigging Practices (15 Hours)

Describes basic rigging and crane hazards and related safety procedures, provides an overview of personnel lifting and lift planning, and introduces crane load charts and load balancing. Includes instructions for rigging and lifting pipe.

Trainee \$18.00 **ISBN 0-13-227715-8**
 Instructor \$18.00 **ISBN 0-13-227717-4**

Product Supplements

Computerized Testing Software

(includes exams for both Rigging Fundamentals and Rigging)

ISBN 0-13-227718-2 **\$30**



Rigging

L2 RIGGING

Curriculum Notes

- 85 Hours
- Published: 2006

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-227296-2**
 Annotated Instructor's Guide: \$88 **ISBN 0-13-227297-0**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

38201-06 Wire Rope (10 Hours)

Covers the components of wire rope, as well as inspection requirements and procedures for using wire rope, load blocks, and sheaves. Also explained are proper installation of wire rope and maintenance guidelines, as well as end terminations and preparation.

Trainee \$18.00 **ISBN 0-13-228998-9**
 Instructor \$18.00 **ISBN 0-13-228969-5**

38202-06 Telescopic Boom Assembly and Disassembly (15 Hours)

Covers the extension and stowing of the swing-away extension, A-frame jib, and auxiliary single-sheave boom head, as well as the assembly and removal of intermediate boom sections.

Trainee \$18.00 **ISBN 0-13-228964-4**
 Instructor \$18.00 **ISBN 0-13-228970-9**

38203-06 Lattice Boom Assembly and Disassembly (15 Hours)

Provides a step-by-step approach to the assembly and disassembly of long and short lattice booms.

Trainee \$18.00 **ISBN 0-13-228965-2**
 Instructor \$18.00 **ISBN 0-13-228971-7**

38204-06 Lift Planning (20 Hours)

Provides an in-depth look at the development of a lift plan. Topics include reference information, calculations, single- and multiple-crane lift planning, and engineering considerations.

Trainee \$18.00 **ISBN 0-13-228967-9**
 Instructor \$18.00 **ISBN 0-13-228972-5**

38205-06 Advanced Rigging Practices (20 Hours)

Explains how the load weight load and center of gravity affect the lift. Covers sling selection and spreader bar applications, and explains the uses of jacks, tuggers, hoist, skids, and rollers, as well as cribbing and blocking. Case studies with photos of complex rigging operations at industrial sites are included.

Trainee \$18.00 **ISBN 0-13-228968-7**
 Instructor \$18.00 **ISBN 0-13-229008-1**

38206-06 Personnel Lifts (5 Hours)

Discusses *ASME B30.23* and *29CFR 1926.550 (g)* and various recommendations governing the safe hoisting of personnel. Covers platform and crane requirements, as well as inspection and test lifting.

Trainee \$18.00 **ISBN 0-13-229266-1**
 Instructor \$18.00 **ISBN 0-13-229267-X**

Product Supplements

Computerized Testing Software (includes exams for both Rigging Fundamentals and Rigging)

ISBN 0-13-227718-2 **\$30**

Transparency Masters

ISBN 0-13-229344-7 **\$25**

Scaffolding

L1 SCAFFOLDING

LEVEL 1

Curriculum Notes

- Total Hours: 145 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1999
- Also available in Spanish. Only the Trainee Guide, tests and transparency masters have been translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests. Ordering information below.

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-014876-8**
 Annotated Instructor's Guide: \$60 **ISBN 0-13-014877-6**

SPANISH VERSION (Paperback)

Trainee Guide: \$60 **ISBN 0-13-601447-X**
 Instructor's Guide: \$60 **ISBN 0-13-601448-8**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

31101 Introduction to the Trade (5 Hours)

Introduces the scaffolding program, describes the duties of a scaffolder, and identifies scaffold types and scaffolding terms.
 Trainee \$18.00 **ISBN 0-13-015451-2**
 Instructor \$18.00 **ISBN 0-13-015459-8**

31102 Trade Safety (7.5 Hours)

Provides a comprehensive overview of the safety regulations and guidelines in the scaffolding industry.
 Trainee \$18.00 **ISBN 0-13-015452-0**
 Instructor \$18.00 **ISBN 0-13-015450-4**

31103 Trade Tools and Equipment (7.5 Hours)

Covers the safe use and applications of hand and power tools used in the trade.
 Trainee \$18.00 **ISBN 0-13-015453-9**
 Instructor \$18.00 **ISBN 0-13-015461-X**

31104 Trade Math (7.5 Hours)

Explains and gives examples of math calculations of scaffold loads, including area loads, concentrated loads, live loads, cantilevered loads, and wind loads.
 Trainee \$18.00 **ISBN 0-13-015455-5**
 Instructor \$18.00 **ISBN 0-13-015463-6**

31105 Stationary Scaffolds (27.5 Hours)

Identifies the equipment used with stationary scaffolds. Describes the procedures for erecting stationary scaffolds.
 Trainee \$18.00 **ISBN 0-13-015456-3**
 Instructor \$18.00 **ISBN 0-13-015464-4**

31106 Mobile Scaffolds (10 Hours)

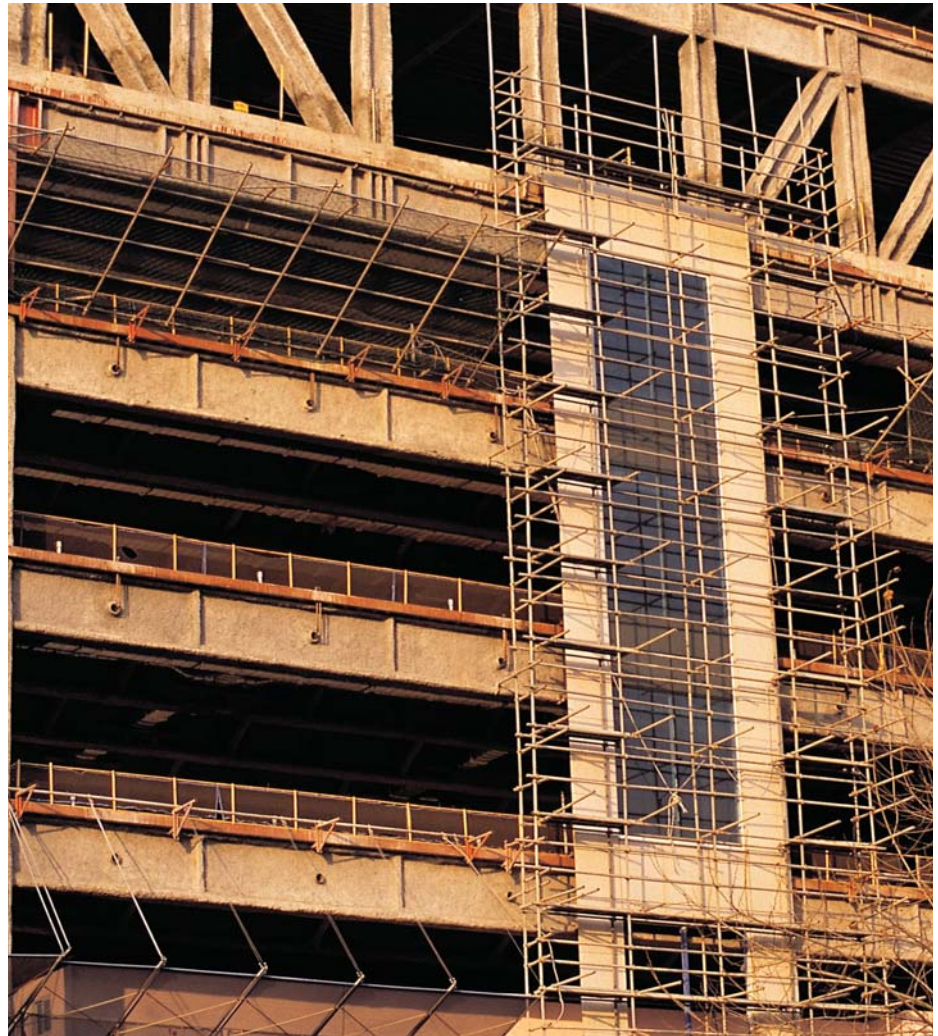
Identifies the different types of powered and manually propelled mobile scaffolds and describes their erection and operation.
 Trainee \$18.00 **ISBN 0-13-015457-1**
 Instructor \$18.00 **ISBN 0-13-015465-2**

31107 Suspension Scaffolds (7.5 Hours)

Identifies and explains the types of equipment used with suspension scaffolds. Describes the rigging of suspension scaffolds.
 Trainee \$18.00 **ISBN 0-13-015458-X**
 Instructor \$18.00 **ISBN 0-13-015466-0**

Product Supplements

Computerized Testing Software ISBN 0-13-015514-4	\$30
Transparency Masters ISBN 0-13-015507-1	\$20
Transparency Masters in Spanish ISBN 0-13-603619-8	\$20



Sheet Metal

L1 SHEET METAL



LEVEL 1

Curriculum Notes

- Total Hours: 175 (includes 22.5 elective hours and 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1992 To Be Revised: Spring 2008, Third Edition
- Includes full-color insert
- NATE Recognized Training Provider—see p. 38



PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-604482-4**
 Annotated Instructor's Guide: \$60 **ISBN 0-13-604483-2**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

04101-08 Introduction to the Sheet Metal Trade (5 Hours)

Summarizes the history and development of the sheet metal trade, explains the benefits of apprenticeship training, and identifies career opportunities in the trade.

Trainee \$18.00 **ISBN 0-13-604832-3**
 Instructor \$18.00 **ISBN 0-13-604878-1**

04102-08 Tools of the Trade (5 Hours)

Describes the hand and power tools used in the sheet metal trade, including layout tools and cutting, bending, and forming machines. Includes safety and maintenance guidelines.

Trainee \$18.00 **ISBN 0-13-604833-1**
 Instructor \$18.00 **ISBN 0-13-604879-X**

04103-08 Introduction to Sheet Metal Layout and Processes (7.5 Hours)

Introduces parallel line development, radial line development, and triangulation. Covers selection and use of layout, hand, and machine tools. Discusses how to transfer patterns, and how to cut, form, and assemble parts.

Trainee \$18.00 **ISBN 0-13-604834-X**
 Instructor \$18.00 **ISBN 0-13-604880-3**

04104-08 Trade Math One (20 Hours)

Builds on trainees' basic math skills to solve trade-related problems. Covers calculations using denominate numbers, area and volume calculations, English-metric system conversions, basic geometry, and calculation of stretchouts.

Trainee \$18.00 **ISBN 0-13-604835-8**
 Instructor \$18.00 **ISBN 0-13-604881-1**

04105-08 Fabrication One – Parallel Line Development (22.5 Hours)

Covers the steps involved in using the parallel line development method to lay out fittings and includes step-by-step procedures for selected fittings.

Trainee \$18.00 **ISBN 0-13-604837-4**
 Instructor \$18.00 **ISBN 0-13-604882-X**

NEW! 04106-08 Installation of Ductwork (15 Hours)

Addresses ductwork assembly, use of different types of sealants, using lifts, and installation of ductwork. Describes the types of fasteners (screws, nuts, bolts, and rivets), and supports used in an air distribution system. Discusses proper spacing of hangers, load ratings, and installation of hangers and support systems.

Trainee \$18.00 **ISBN 0-13-604838-2**
 Instructor \$18.00 **ISBN 0-13-604883-8**

04107-08 Installation of Air Distribution Accessories (5 Hours)

Describes how air distribution accessories, such as louvers, dampers, and access doors, function as part of an air distribution system. Includes installation guidelines and checklists.

Trainee \$18.00 **ISBN 0-13-604874-9**
 Instructor \$18.00 **ISBN 0-13-604884-6**

04108-08 Insulation (7.5 Elective Hours)

Describes how to install fiberglass blanket, foam, and pipe insulation using approved adhesives and fastening techniques. Also includes the fabrication and installation of fitting covers and preformed fitting covers.

Trainee \$18.00 **ISBN 0-13-604875-7**
 Instructor \$18.00 **ISBN 0-13-604886-2**

04109-08 Architectural Sheet Metal (15 Elective Hours)

Provides instruction in how to lay out and fabricate sheet metal components of a roof drainage system. Includes flashing, gutters, and downspouts.

Trainee \$18.00 **ISBN 0-13-604877-3**
 Instructor \$18.00 **ISBN 0-13-604887-0**

Product Supplements	
Computerized Testing Software ISBN 0-13-605589-3	\$30
Transparency Masters ISBN 0-13-605610-5	\$25
NEW! PowerPoint® Presentation Slides (in color) —under development—due Fall 2008 ISBN 0-13-605590-7	\$40

L2 SHEET METAL

LEVEL 2

Curriculum Notes

- 165 Hours (145 required; 20 elective)
- Published: 1992 Revised: 2002
- Includes full-color insert
- NATE Recognized Training Provider—see p. 38
- Revision under way and due in stock Fall 2008. To backorder the revisions, please use the ISBNs listed following the Product Supplements.



PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-047228-X**
 Annotated Instructor's Guide: \$88 **ISBN 0-13-047220-4**

BINDER

Trainee Guide: \$93 **ISBN 0-13-047229-8**
 Annotated Instructor's Guide: \$93 **ISBN 0-13-047231-X**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

04201-02 Trade Math Two (20 Hours)

Demonstrates how to apply mathematical formulas to solve a variety of mathematical problems. Covers linear, area, volume, and angle measurement and percentages, ratios, and proportions. Provides practical instruction in using protractors, vernier calipers, and micrometers and in solving field measuring problems.

Trainee: \$18.00 **ISBN 0-13-103005-1**
 Instructor: \$18.00 **ISBN 0-13-103015-9**

04202-02 Basic Piping Practices (7.5 Hours)

Reviews the methods for measuring, cutting, and joining selected types of pipe using fittings, hangers, and supports. Also reviews pipe materials and applications.

Trainee: \$18.00 **ISBN 0-13-103006-X**
 Instructor: \$18.00 **ISBN 0-13-103016-7**



Sheet Metal

04203-02 Fabrication Two: Radial Line Development (55 Hours)

Introduces trainees to the principles of radial line development that are used to determine layouts for sheet metal fittings. Includes practice layout and fabrication tasks that allow trainees to develop and demonstrate their skills.

Trainee: \$18.00 **ISBN 0-13-103007-8**
 Instructor: \$18.00 **ISBN 0-13-103017-5**

04204-02 Bend Allowances (5 Hours)

Provides instruction and practice in determining proper bend allowances in sheet metal. Also demonstrates how to lay out and fabricate sheet metal according to calculations.

Trainee: \$18.00 **ISBN 0-13-103008-6**
 Instructor: \$18.00 **ISBN 0-13-103018-3**

04205-02 Blueprints and Specifications (20 Hours)

Reviews how to read and interpret section, elevation, and detail drawings. Also covers other specifications and other sources of project information. Includes blueprints.

Trainee: \$18.00 **ISBN 0-13-103009-4**
 Instructor: \$18.00 **ISBN 0-13-103019-1**

04206-02 Air Properties and Distribution (15 Hours)

Explains the properties of air and how these properties relate to one another. Teaches how to use the gas laws, psychrometric charts, and measuring instruments to evaluate air properties in an air distribution system.

Trainee: \$18.00 **ISBN 0-13-103010-8**
 Instructor: \$18.00 **ISBN 0-13-103020-5**

04207-02 Sheet Metal Duct Fabrication Standards (7.5 Hours)

Explains how to determine the various requirements for a duct system, including operating pressures, metal gauges, connectors, reinforcements, tie rods, and seams. Also reviews how to use standards, codes, and ordinances to design a duct system.

Trainee: \$18.00 **ISBN 0-13-103012-4**
 Instructor: \$18.00 **ISBN 0-13-103021-3**

04208-02 Soldering (15 Hours)

Identifies soldering tools, materials, and techniques. Also provides trainees with a wide range of soldering tasks for practice.

Trainee: \$18.00 **ISBN 0-13-103013-2**
 Instructor: \$18.00 **ISBN 0-13-103022-1**

04209-02 Fiberglass Duct (20 Elective Hours)

Reviews fiberglass duct as well as layout and fabrication methods. Also discusses closure, hanging, and support methods and how to repair major and minor damage to fiberglass duct.

Trainee: \$18.00 **ISBN 0-13-103014-0**
 Instructor: \$18.00 **ISBN 0-13-103023-X**

Product Supplements

Computerized Testing Software ISBN 0-13-046699-9	\$30
Transparency Masters ISBN 0-13-049857-2	\$25

Ordering information for the Third Edition due Fall 2008:

PAPERBACK

Trainee Guide: \$88	ISBN 0-13-604484-0
Annotated Instructor's Guide: \$88	ISBN 0-13-604485-9

L3 SHEET METAL

LEVEL 3

Curriculum Notes

- 160 Hours (140 required; 20 elective)
- Published: 1992 Revised: 2003
- NATE Recognized Training Provider—see p. 38
- A revision is under way and due in stock Spring 2009.



PAPERBACK

Trainee Guide: \$88	ISBN 0-13-102607-0
Annotated Instructor's Guide: \$88	ISBN 0-13-102610-0

BINDER

Trainee Guide: \$93	ISBN 0-13-102608-9
Annotated Instructor's Guide: \$93	ISBN 0-13-102611-9

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

04301-03 Trade Math Three: Field Measuring and Fitting (15 Hours)

Describes the techniques used for field measuring and layout of ductruns and fittings. Also provides practice field measuring problems.

Trainee: \$18.00 **ISBN 0-13-103024-8**
 Instructor: \$18.00 **ISBN 0-13-103033-7**

04302-03 Air Systems (10 Hours)

Reviews the operating principles, components, and applications of common all-air systems. Discusses constant volume systems, variable volume systems, variable temperature (VVT) systems, variable air volume (VAV) systems, and dual-duct VAV systems.

Trainee: \$18.00 **ISBN 0-13-103025-6**
 Instructor: \$18.00 **ISBN 0-13-103034-5**

04303-03 Introduction to Welding, Brazing, and Cutting (20 Hours)

Introduces trainees to the equipment and techniques of welding metal. Discusses the different types of metal joints and how to weld them. Includes shielded metal-arc welding, carbon-arc welding, brazing, and flame cutting methods.

Trainee: \$18.00 **ISBN 0-13-103026-4**
 Instructor: \$18.00 **ISBN 0-13-103035-3**

04304-03 Principles of Refrigeration (7.5 Hours)

Introduces trainees to refrigeration systems and their components. Explains the refrigeration cycle and the role of heat pumps.

Trainee: \$18.00 **ISBN 0-13-103027-2**
 Instructor: \$18.00 **ISBN 0-13-103036-1**

04305-03 Principles of Airflow (22.5 Hours)

Explains the basic principles of airflow and reviews how airflow is affected by duct size, shape, and fittings. Also reviews the components of an air distribution system.

Trainee: \$18.00 **ISBN 0-13-103028-0**
 Instructor: \$18.00 **ISBN 0-13-103038-8**

04306-03 Comprehensive Blueprint and Specification Reading (30 Hours)

Provides a case-study approach to learning how to use building plans and specifications to lay out, fabricate, and install HVAC systems. Allows trainees to proceed through the module as if they were working on an actual building project. Includes blueprints.

Trainee: \$18.00 **ISBN 0-13-103030-2**
 Instructor: \$18.00 **ISBN 0-13-103039-6**

04307-03 Fabrication Three: Triangulation (40 Hours)

Describes the principles of triangulation and how it can be used to measure ductrun fittings. Provides trainees with a variety of tasks to practice developing, laying out, and fabricating selected ductrun fittings.

Trainee: \$18.00 **ISBN 0-13-103031-0**
 Instructor: \$18.00 **ISBN 0-13-103040-X**

04308-03 Architectural Sheet Metal (15 Elective Hours)

Provides instruction in how to lay out and fabricate the various sheet metal components of a roof drainage system. Includes flashing, gutters, and downspouts.

Trainee: \$18.00 **ISBN 0-13-103032-9**
 Instructor: \$18.00 **ISBN 0-13-103062-0**

Sheet Metal

Product Supplements	
Computerized Testing Software ISBN 0-13-103322-0	\$30
Transparency Masters ISBN 0-13-103333-6	\$25

L4 SHEET METAL

LEVEL 4

Curriculum Notes

- 151 Hours
- Published: 1992 Revised: 2003
- NATE Recognized Training Provider—see p. 38
- A revision is under way and due in stock Fall 2009.



PAPERBACK

Trainee Guide: \$88	ISBN 0-13-108926-9
Annotated Instructor's Guide: \$88	ISBN 0-13-108928-5

BINDER

Trainee Guide: \$93	ISBN 0-13-108927-7
Annotated Instructor's Guide: \$93	ISBN 0-13-108930-7

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

04401-03 Shop Production and Organization (25 Hours)

Introduces trainees to the important production, organization, planning, and control functions that occur in a sheet metal shop. Includes discussions of project planning techniques, principles of efficient shop layout and materials flow, and the roles and relationships of shop personnel.

Trainee \$18.00	ISBN 0-13-109070-4
Instructor \$18.00	ISBN 0-13-109076-3

04402-03 Air Balance (25 Hours)

Describes how to balance air distribution systems so that the right amount of air is correctly distributed at the proper velocities and returned to the heating and cooling units. Reviews the tools and techniques used for adjusting fans, volume dampers, registers, and grilles.

Trainee \$18.00	ISBN 0-13-109071-2
Instructor \$18.00	ISBN 0-13-109077-1

04403-03 Louvers, Dampers, and Access Doors (20 Hours)

Discusses the different types of louvers, dampers, and access doors used in air distribution systems, and reviews the standards that apply to them. Includes several louver fabrication exercises.

Trainee \$18.00	ISBN 0-13-109072-0
Instructor \$18.00	ISBN 0-13-109078-X

04404-03 Fume and Exhaust System Design (25 Hours)

Discusses effective and safe workspace ventilation. Introduces the trainees to applicable standards and regulations and reviews the many different types of hoods, filters, and duct designs used in fume and exhaust systems.

Trainee \$18.00	ISBN 0-13-109073-9
Instructor \$18.00	ISBN 0-13-109079-8

04405-03 Fabrication Four: Comprehensive Review (40 Hours)

Offers twelve fabrication tasks that serve as a comprehensive review of parallel line, radial line, and triangulation pattern development methods.

Trainee \$18.00	ISBN 0-13-109074-7
Instructor \$18.00	ISBN 0-13-109080-1

04406-03 (MT101) Introductory Skills for the Crew Leader (16 Hours)

Teaches the basic skills required to supervise personnel. Discusses principles of project planning and management and presents several case studies for student participation.

Participant \$40.00	ISBN 0-13-103593-2
Instructor \$60.00	ISBN 0-13-103594-0

NOTE: This module is from the Contren® Management Learning Series (see page 100 for more information). Students may be eligible to receive craft and management transcripts from NCCER's National Registry.

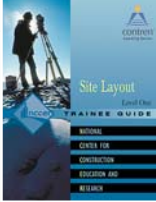
Product Supplements	
Computerized Testing Software ISBN 0-13-109122-0	\$30
Transparency Masters ISBN 0-13-109119-0	\$25



Site Layout

L1 SITE LAYOUT

LEVEL 1



Curriculum Notes

- Total Hours: 162.5 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 2004

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-109173-5**
 Annotated Instructor's Guide: \$60 **ISBN 0-13-109175-1**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

78101-04 Introduction to Site Layout (10 Hours)

Provides an overview of the site layout trade and related tasks. Covers the use of the builder's level and leveling rods, as well as the equipment and procedures for making distance measurements by taping (chaining). Also covers the elements of professional conduct, safety, and communications. Briefly describes the aspects of an apprenticeship program and the career path and professional opportunities related to the site layout trade.

Trainee \$18.00 **ISBN 0-13-109882-9**
 Instructor \$18.00 **ISBN 0-13-109887-X**

78102-04 Surveying Math (30 Hours)

Expands upon the knowledge gained in the *Core Curriculum* module, *Introduction to Construction Math*. Emphasis is placed on the metric system, including how to convert between English and metric system units. Covers basic concepts for working with formulas and equations, as well as the basic concepts of geometry and right-angle trigonometry.

Trainee \$18.00 **ISBN 0-13-109883-7**
 Instructor \$18.00 **ISBN 0-13-109888-8**

78103-04 Survey Equipment Use and Care One (30 Hours)

Covers the use and care of tools and instruments commonly used to perform site survey work. Introduces the instruments and procedures used for making distance measurements electronically and for performing differential leveling and basic horizontal and vertical angular measurements. Includes guidelines for recording surveying measurement data in field notes.

Trainee \$18.00 **ISBN 0-13-109884-5**
 Instructor \$18.00 **ISBN 0-13-109889-6**

78104-04 Blueprint Reading for Surveyors (20 Hours)

Expands upon the *Core Curriculum* module, *Introduction to Blueprints*. Teaches the techniques for reading and using blueprints and specifications, with an emphasis placed on those drawings and types of information that are relevant to the site layout trade.

Trainee \$18.00 **ISBN 0-13-109886-1**
 Instructor \$18.00 **ISBN 0-13-109890-X**

Product Supplements

Computerized Testing Software ISBN 0-13-109913-2	\$30
Transparency Masters ISBN 0-13-109899-3	\$25

L2 SITE LAYOUT

LEVEL 2

Curriculum Notes

- 145 Hours
- Published: 2004

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-109176-X**
 Annotated Instructor's Guide: \$88 **ISBN 0-13-109177-8**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

78201-04 Advanced Surveying Math (30 Hours)

Covers the advanced math needed for site layout, including area and volume of solids, use of the Pythagorean Theorem to solve for distances and angles, and use of polar and rectangular coordinates. Covers common coordinate and grid systems.

Trainee \$18.00 **ISBN 0-13-160021-4**
 Instructor \$18.00 **ISBN 0-13-160029-X**

78202-04 Survey Equipment Use and Care Two, EDMIs and Total Stations (10 Hours)

Covers the setup, use, calibration, and care of electronic distance measuring instruments and total stations.

Trainee \$18.00 **ISBN 0-13-160022-2**
 Instructor \$18.00 **ISBN 0-13-160030-3**

78203-04 Control Setup (30 Hours)

Contains information and instructions for setting up, running, recording, and closing a horizontal traverse and a level loop. Also covers primary and secondary control plans, as well as vertical control for multilevel structures.

Trainee \$18.00 **ISBN 0-13-160023-0**
 Instructor \$18.00 **ISBN 0-13-160031-1**

78204-04 Boundary and Topography Surveys (10 Hours)

Contains information and instructions for gathering, recording, and plotting profile and cross-section leveling data. Includes plot and site plans to identify rights-of-way, utilities, setbacks, boundaries, and tie-in locations.

Trainee \$18.00 **ISBN 0-13-160024-9**
 Instructor \$18.00 **ISBN 0-13-160032-X**

78205-04 Data Collection and Basic Computer Skills (10 Hours)

Covers the use of integrated total station systems and GPS surveying systems. Explains the use of integrated field and office software to collect and manage data.

Trainee \$18.00 **ISBN 0-13-160025-7**
 Instructor \$18.00 **ISBN 0-13-160033-8**

78206-04 Concrete Properties and Quality Control (15 Hours)

Covers the chemical and physical properties of concrete and the components, such as cement, aggregates, and admixtures, that make up the concrete mixture. Explains the various methods and equipment used to sample, test, and inspect concrete.

Trainee \$18.00 **ISBN 0-13-160026-5**
 Instructor \$18.00 **ISBN 0-13-160034-6**

78207-04 Means and Methods (40 Hours)

Provides extensive coverage of soils and their classifications and explains how various soils behave in excavations. Covers the safety procedures and equipment used when working in or near trenches. Provides layout procedures for footings, piers, building corners, columns, walls, embedments, and stairs.

Trainee \$18.00 **ISBN 0-13-160027-3**
 Instructor \$18.00 **ISBN 0-13-160035-4**

Product Supplements

Computerized Testing Software ISBN 0-13-109914-0	\$30
Transparency Masters ISBN 0-13-109900-0	\$25



Sprinkler Fitting

18101-07 Introducción al oficio

Trainee \$18.00 ISBN 0-13-614682-1

18102-07 Introducción a los componentes y sistemas

Trainee \$18.00 ISBN 0-13-614683-X

18103-07 Tubería de acero

Trainee \$18.00 ISBN 0-13-614684-8

18104-07 Tuberías y piezas de CPVC

Trainee \$18.00 ISBN 0-13-614685-6

18105-07 Tubería de cobre

Trainee \$18.00 ISBN 0-13-614687-2

18106-07 Tubería subterránea

Trainee \$18.00 ISBN 0-13-614688-0

Product Supplements

Computerized Testing Software (includes both English & Spanish tests) ISBN 0-13-229108-8	\$30
Transparency Masters ISBN 0-13-614941-3	\$25

L2 SPRINKLER FITTING

LEVEL 2

Curriculum Notes

- 152.5 Hours
- Published: 1995 Revised: 2007, Second Edition
- Written to the 2007 NFPA 13 Standard
- Includes full-color insert

PAPERBACK

Trainee Guide: \$88 ISBN 0-13-614434-9

Annotated
Instructor's Guide: \$88 ISBN 0-13-614435-7

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

18201-07 Hangers, Supports, Restraints, and Guides (15 Hours)

Identifies and describes strength/spacing requirements, types, and installation of pipe hangers, supports, restraints, and guides. Covers types and installation of earthquake bracing and explains sleeving and firestopping.

Trainee \$18.00 ISBN 0-13-614667-8

Instructor \$18.00 ISBN 0-13-614709-7

L1 SPRINKLER FITTING

LEVEL 1



Curriculum Notes

- Total Hours: 145 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1995 Revised: 2007, Second Edition
- Written to the 2007 NFPA 13 Standard
- Includes full-color insert
- Trainee Guide available in Spanish Translation. See ordering information following Level 1 module contents.

PAPERBACK

Trainee Guide: \$60 ISBN 0-13-228611-4

Annotated
Instructor's Guide: \$60 ISBN 0-13-228612-2

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

18101-07 Orientation to the Trade (5 Hours)

Identifies sprinkler fitter career opportunities and looks at some typical work environments. Examines trade-specific safety hazards and identifies shop plans specific to the sprinkler fitting industry. Introduces workplace safety, material handling, and common tools. Illustrates the correct use of common tools.

Trainee \$18.00 ISBN 0-13-614689-9

Instructor \$18.00 ISBN 0-13-614696-1

18102-07 Introduction to Components and Systems (7.5 Hours)

Introduces testing laboratories and listing agencies. Provides an overview of the major types of sprinkler systems including wet pipe, dry pipe, preaction, and deluge systems. Defines sprinkler-head types, orifice size, and K-Factor. Underground and above-ground pipe and tubes are discussed, including hangers, bracing, and restraints. Summarizes valves, alarms, and fire department connections.

Trainee \$18.00 ISBN 0-13-614690-2

Instructor \$18.00 ISBN 0-13-614697-X

18103-07 Steel Pipe (22.5 Hours)

Identifies steel piping materials along with tools used to cut and thread steel pipe. Describes methods for threading, cutting, and grooving pipe, including how to determine pipe length between fittings (takeouts). Discusses threaded, plain-end, and flanged fittings. Covers grooved pipe and fittings including installation techniques.

Trainee \$18.00 ISBN 0-13-614691-0

Instructor \$18.00 ISBN 0-13-614698-8

18104-07 CPVC Pipe and Fittings (10 Hours)

Describes handling and storing of CPVC pipe. Identifies CPVC safety concerns and cautions. Outlines methods and tools for cutting, chamfering, and cleaning CPVC pipe, including calculating takeouts. Joining techniques are described, particularly the solvent-cement (one-step) method. Rules for using plastic pipe hangers are explained.

Trainee \$18.00 ISBN 0-13-614692-9

Instructor \$18.00 ISBN 0-13-614699-6

18105-07 Copper Tube Systems (10 Hours)

Introduces copper tubing and fittings along with cutting and bending tools. The soldering process is described along with techniques for measuring, cutting, reaming, and cleaning. Brazing is described as are brazing metals, fluxes, and brazing equipment. Support bracing for copper tube is discussed as are grooved couplings for copper pipe.

Trainee \$18.00 ISBN 0-13-614693-7

Instructor \$18.00 ISBN 0-13-614665-1

18106-07 Underground Pipe (17.5 Hours)

Details underground piping installations for various types of pipe. Thrust blocks and restraints are explained. In-building risers, hydrants, yard valves, and hydrant houses are discussed as are testing, inspection, flushing, and chlorinating. The underground test certificate is covered.

Trainee \$18.00 ISBN 0-13-614695-3

Instructor \$18.00 ISBN 0-13-614666-X

Product Supplements

Computerized Testing Software (includes both English & Spanish tests) ISBN 0-13-229108-8	\$30
Transparency Masters ISBN 0-13-229161-4	\$25

L1 SPRINKLER FITTING

LEVEL 1
IN SPANISH

Curriculum Notes

- Instalación de Rociadores Nivel Uno: Segunda edición has been translated from the 2007 revision of Sprinkler Fitting Level 1.
- Only the Trainee Guide, tests and transparency masters have been translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests.

PAPERBACK

Trainee Guide: \$60 ISBN 0-13-614433-0

Instructor's Version: \$60 ISBN 0-13-614763-1

MODULES

All of the modules listed below are included in the Trainee and Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.



Sprinkler Fitting

18202-07 General Purpose Valves (15 Hours)

Covers the various types of valves and valve applications used in the sprinkler industry, including service procedures for standard valves. Also covers installation of OS&Y valves, butterfly grooved valves, and tamper switches. Outlines procedures for disassembling, servicing, and reassembling check valves.

Trainee \$18.00 **ISBN 0-13-614668-6**
 Instructor \$18.00 **ISBN 0-13-614711-9**

18203-07 General Trade Math (20 Hours)

Explains basic math principles used to solve everyday problems, including converting quantities from the English system to the metric system and vice versa. Specific sprinkler fitting problems are covered such as calculating 45-degree offsets and tank volume, centering sprinkler heads using geometric methods, and problems relating to hanger sizing.

Trainee \$18.00 **ISBN 0-13-614669-4**
 Instructor \$18.00 **ISBN 0-13-614712-7**

18204-07 Shop Drawings (32.5 Hours)

Instructs how to read drawings to identify materials, calculate square footage and number of sprinklers required, lay out sprinkler hanger locations, and identify sprinkler orifice sizes.

Trainee \$18.00 **ISBN 0-13-614670-8**
 Instructor \$18.00 **ISBN 0-13-614713-5**

18205-07 Standard Spray Fire Sprinklers (20 Hours)

Discusses standard spray sprinklers relative to occupancies and to maximum coverage calculations. Explains how to identify sprinkler manufacturer and type using the Sprinkler Identification Number (SIN).

Trainee \$18.00 **ISBN 0-13-614671-6**
 Instructor \$18.00 **ISBN 0-13-614714-3**

18206-07 Wet Pipe Fire Sprinkler Systems (25 Hours)

Explains the purpose, function, and operation of wet pipe system components. Describes riser check valves, alarm check valves, and trim; flow, tamper, and pressure switches; fire department connections and hose stations; antifreeze systems; faulty pressure gauges; inspector's test connections and auxiliary drains; and hydrostatic testing and test pumps.

Trainee \$18.00 **ISBN 0-13-614672-4**
 Instructor \$18.00 **ISBN 0-13-614715-1**

18207-07 Dry-Pipe Systems (25 Hours)

Explains the purpose, function, and operation of components used in a dry-pipe system. Instructs how to install pressure gauges on alarm valves and accelerators, how to set and adjust an air maintenance device, and how to reset and troubleshoot dry-pipe systems.

Trainee \$18.00 **ISBN 0-13-614673-2**
 Instructor \$18.00 **ISBN 0-13-614716-X**

Product Supplements	
Computerized Testing Software ISBN 0-13-614784-4	\$30
Transparency Masters ISBN 0-13-614800-X	\$25

L3 SPRINKLER FITTING

REVISÉD! LEVEL 3 Curriculum Notes

- Total Hours: 147.5
- Published: 1995 Revised: 2007, Second Edition
- Written to the 2007 NFPA 13 Standard
- Includes full-color insert

PAPERBACK	
Trainee Guide: \$88	ISBN 0-13-614436-5
Annotated Instructor's Guide: \$88	ISBN 0-13-614437-3

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

18301-07 Deluge/Preaction Systems (40 Hours)

Describes deluge and preaction systems and explains installation techniques and troubleshooting. Covers hydraulic and pneumatic release mechanisms, non-interlocked and interlocked preaction systems and Firecycle® Systems.

Trainee \$18.00 **ISBN 0-13-601400-3**
 Instructor \$18.00 **ISBN 0-13-601406-2**

18302-07 Standpipes (25 Hours)

Describes standpipe classifications and explains flow capabilities of each type. Covers requirements for sizing and installation of standpipes. Explains pressure reducing valves, under flow and no flow conditions. Also covers LINK-SEAL® installations.

Trainee \$18.00 **ISBN 0-13-601401-1**
 Instructor \$18.00 **ISBN 0-13-601407-0**

18303-07 Water Supplies (15 Hours)

Covers basic water chemistry and properties. Discusses methods of determining water supply requirements and considerations for supply systems. Discusses infrastructure, measurement of water supply capability, water supply appurtenances, fire department connections, and typical city water pits.

Trainee \$18.00 **ISBN 0-13-601403-8**
 Instructor \$18.00 **ISBN 0-13-601408-9**

18304-07 Fire Pumps (40 Hours)

Covers fire pump categories and components. Describes fire pump controller requirements and fire pump performance and alignment. Explains pump and driver characteristics and performance curves as well as controllers, sensing lines, supervision, and starting methods. Outlines project requirements, installation, maintenance, and troubleshooting.

Trainee \$18.00 **ISBN 0-13-601404-6**
 Instructor \$18.00 **ISBN 0-13-601445-3**

18305-07 Application-Specific Sprinklers and Nozzles (27.5 Hours)

Describes application-specific sprinkler types and requirements. Discusses area of coverage, positioning, and obstruction requirements and explains system selection.

Trainee \$18.00 **ISBN 0-13-601405-4**
 Instructor \$18.00 **ISBN 0-13-601446-1**

Product Supplements	
Computerized Testing Software ISBN 0-13-614786-0	\$30
Transparency Masters ISBN 0-13-614802-6	\$25

L4 SPRINKLER FITTING

REVISÉD! LEVEL 4 Curriculum Notes

- Total Hours: 145
- Published: 1995 Revised: 2008, Second Edition
- Written to the 2007 NFPA 13 Standard
- Includes full-color insert

PAPERBACK	
Trainee Guide: \$88	ISBN 0-13-614438-1
Annotated Instructor's Guide: \$88	ISBN 0-13-614440-3

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

18401-08 System Layout (45 Hours)

Identifies and explains basic hydraulic concepts and selection of hydraulic design methods. System configuration, design criteria, discharge characteristics, and types of pressure loss are explained. Performing fire sprinkler system hydraulic calculations is also covered in this module.

Trainee \$18.00 **ISBN 0-13-604806-4**
 Instructor \$18.00 **ISBN 0-13-604811-0**

Sprinkler Fitting

18402-08 Inspection, Testing, and Maintenance (17.5 Hours)

Identifies and explains initial and periodic testing and inspection requirements, as well as maintenance and repair of wet pipe systems, dry pipe systems, preaction/deluge systems, and special systems.

Trainee \$18.00 **ISBN 0-13-604807-2**
 Instructor \$18.00 **ISBN 0-13-604812-9**

18403-08 Special Extinguishing Systems (42.5 Hours)

Identifies and explains the following extinguishing exposure systems: water spray, foam, carbon dioxide, Halon, auxiliary and local alarm. Limited water systems, fire extinguishers, and water mist suppression systems are also covered.

Trainee \$18.00 **ISBN 0-13-604808-0**
 Instructor \$18.00 **ISBN 0-13-604813-7**

18404-08 Introductory Skills for the Foreman (20 Hours)

Introduces the trainee to foremanship and covers responsibilities, leadership, and safety. Also explains project documentation and reports related to materials tracking and labor tracking.

Trainee \$18.00 **ISBN 0-13-604809-9**
 Instructor \$18.00 **ISBN 0-13-604814-5**

18405-08 Proper Procedures and Documentation (20 Hours)

Explains the importance of proper documentation to ensure correct installation and avoid future rework and possible unintentional releases. Emphasizes the need to properly document the actual installation using written reports and photographs. Includes causes of and responses to water damage, and provides a detailed case history of an unintentional release.

Trainee \$18.00 **ISBN 0-13-604810-2**
 Instructor \$18.00 **ISBN 0-13-604815-3**

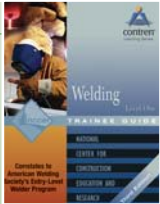
Product Supplements

Computerized Testing Software ISBN 0-13-614787-9	\$30
Transparency Masters ISBN 0-13-614803-4	\$25

Welding

L1 WELDING

LEVEL 1



Curriculum Notes

- Total Hours: 477.5 (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 1992 Revised: 2003, Third Edition
- Sequenced in accordance to the American Welding Society's (AWS) S.E.N.S.E. school requirements. When combined with Welding Level 2, the content complies with all learning objectives specified in AWS EG2.95, Entry-Level Welder.
- All Trainee Guide formats including individual modules are in full-color.
- Lincoln Electric supplements available in the Instructor Resources section at www.nccer.org.
- A revision is under way and due in stock Summer '09.

PAPERBACK

Trainee Guide: \$60 **ISBN 0-13-102574-0**
 Annotated
 Instructor's Guide: \$60 **ISBN 0-13-102578-3**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

29101-03 Welding Safety (2.5 Hours)

Covers safety equipment, protective clothing, and procedures applicable to the cutting and welding of metals.
 Trainee \$18.00 **ISBN 0-13-103198-8**
 Instructor \$18.00 **ISBN 0-13-103210-0**

29102-03 Oxyfuel Cutting (17.5 Hours)

Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and setup requirements. Explains how to light, adjust, and shut down oxyfuel equipment. Trainees will perform cutting techniques that include straight line, piercing, bevels, washing, and gouging.
 Trainee \$18.00 **ISBN 0-13-103199-6**
 Instructor \$18.00 **ISBN 0-13-103211-9**

29103-03 Base Metal Preparation (12.5 Hours)

Describes how to clean and prepare all types of base metals for cutting or welding. Identifies and explains joint design and base metal preparation for all welding tasks.
 Trainee \$18.00 **ISBN 0-13-103200-3**
 Instructor \$18.00 **ISBN 0-13-103212-7**

29104-03 Weld Quality (10 Hours)

Identifies the codes that govern welding. Identifies and explains weld imperfections and causes. Describes non-destructive examination practices, welder qualification tests, and the importance of quality workmanship.
 Trainee \$18.00 **ISBN 0-13-103202-X**
 Instructor \$18.00 **ISBN 0-13-103213-5**

29105-03 SMAW – Equipment and Setup (5 Hours)

Describes SMAW and welding safety. Explains how to connect welding current and set up arc welding equipment. Identifies and explains using tools for cleaning welds.
 Trainee \$18.00 **ISBN 0-13-103203-8**
 Instructor \$18.00 **ISBN 0-13-103214-3**

29106-03 SMAW – Electrodes and Selection (2.5 Hours)

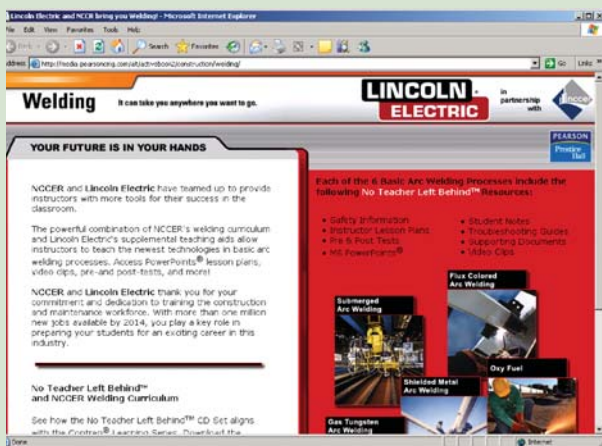
Explains electrode characteristics and different types of filler metals. Describes the role of the American Welding Society (AWS) and the American Society of Mechanical Engineers (ASME). Explains proper storage and control of filler metals and identifies the use of codes.
 Trainee \$18.00 **ISBN 0-13-103204-6**
 Instructor \$18.00 **ISBN 0-13-103215-1**

29107-03 SMAW – Beads and Fillet Welds (120 Hours)

Describes the preparation and setup of arc welding equipment and the process of striking an arc. Explains how to detect and correct arc blow. Describes how to make stringer, weave, overlapping beads, and fillet welds.
 Trainee \$18.00 **ISBN 0-13-103205-4**
 Instructor \$18.00 **ISBN 0-13-103216-X**

TOOLS FOR YOUR SUCCESS

NCCER and Lincoln Electric have teamed up to provide instructors with complimentary resources to teach the newest technologies in basic arc welding processes.



Every Annotated Instructor's Guide now comes packaged with:

- **Arc Welding Safety CD**
Includes the new OSHA hexavalent chromium standards, AWS/ANSI Z49.1 industry safety guidelines, Lincoln Electric's Arc Welding Safety brochure, and more...
- **Welding Safety—The Way the Pros Do It DVD**
Shows the technical and common sense steps to practicing welding safely
- **Eight-page color insert**
Showcases the exciting careers in welding (also comes with every Trainee Guide)

Available in the Instructor Resources section at www.nccer.org:

- **Lincoln Electric's No Teacher Left Behind Series**
Includes the six major welding processes, PowerPoint® presentations, video clips, lesson plans, and more...
- **Welding Connects Your World**
Get students excited about the world of welding at Lincoln Electric's e-learning Web site. Includes welding career paths, interactive PowerPoint® presentations, classroom activities, and more...

Welding

29108-03 SMAW – Groove Welds with Backing (10 Hours)

Explains groove welds and how to set up welding equipment for making groove welds. Describes how to make groove welds with backing. Provides procedures for making flat, horizontal, vertical, and overhead groove welds.

Trainee \$18.00 **ISBN 0-13-103206-2**

Instructor \$18.00 **ISBN 0-13-103217-8**

29109-03 Joint Fit-Up and Alignment (5 Hours)

Identifies and explains job code specifications. Describes the use of fit-up gauges and measuring devices to check fit-up and alignment and the use of plate and pipe fit-up and alignment tools to properly prepare joists. Explains how to check for joint misalignment and poor fit.

Trainee \$18.00 **ISBN 0-13-103207-0**

Instructor \$18.00 **ISBN 0-13-103218-6**

29110-03 SMAW – Open V-Groove Welds (120 Hours)

Explains open V-groove welds and how to set up welding equipment for making open V-groove welds. Provides procedures for making flat, horizontal, vertical, and overhead open V-groove welds.

Trainee \$18.00 **ISBN 0-13-103208-9**

Instructor \$18.00 **ISBN 0-13-103220-8**

29111-03 SMAW – Open-Root Pipe Welds (100 Hours)

Explains open-root pipe welds and how to set up welding equipment for making open-root pipe welds. Provides procedures for making 1G, 2G, 5G, and 6G open-root pipe welds.

Trainee \$18.00 **ISBN 0-13-103209-7**

Instructor \$18.00 **ISBN 0-13-103221-6**

Product Supplements

Computerized Testing Software ISBN 0-13-103315-8	\$30
Transparency Masters ISBN 0-13-103344-1	\$25
PowerPoint® Presentation Slides CD-ROM ISBN 0-13-103316-6	\$40
National Construction Career Test available with this title (see p. 7 for more information)	
NEW! Welding Levels 1-3 Performance Labs Now all 18 of the Performance Acceptance Criteria required by AWS EG2.0-95, "Guide for the Training and Qualification of Welding Personnel—Entry Level Welder," are available in one convenient package for trainees. ISBN 0-13-604297-X	\$25

L2 WELDING

LEVEL 2

Curriculum Notes

- 307.5 Hours (177.5 required; 130 elective)
- Published: 1992 Revised: 2003
- Sequenced in accordance to the American Welding Society's (AWS) S.E.N.S.E. school requirements. When combined with Welding Level 1, the content complies with all learning objectives specified in AWS EG2.95, *Entry-Level Welder*.
- A full-color revision is under way and due in stock Fall '09.

PAPERBACK

Trainee Guide: \$88 **ISBN 0-13-102581-3**

Annotated Instructor's Guide: \$88 **ISBN 0-13-102584-8**

BINDER

Trainee Guide: \$93 **ISBN 0-13-102582-1**

Annotated Instructor's Guide: \$93 **ISBN 0-13-102585-6**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

29201-03 Welding Symbols (5 Hours)

Identifies and explains the different parts of a welding symbol. Describes different types of fillet weld, groove weld, and non-destructive examination symbols. Explains how to read welding symbols on drawings, specifications, and welding procedure specifications.

Trainee \$18.00 **ISBN 0-13-103222-4**

Instructor \$18.00 **ISBN 0-13-103233-X**

29202-03 Reading Welding Detail Drawings (12.5 Hours)

Identifies and explains welding detail drawings. Describes lines, fills, object views, and dimensioning on drawings. Explains how to use notes on drawings and the bill of materials.

Trainee \$18.00 **ISBN 0-13-103223-2**

Instructor \$18.00 **ISBN 0-13-103234-8**

29203-03 SMAW – Stainless Steel Groove and Pipe Welds (80 Elective Hours)

Explains stainless metallurgy and the selection of proper electrodes. Describes stainless steel groove welds and how to set up welding equipment for making stainless steel groove welds. Provides procedures for making flat, horizontal, vertical, and overhead stainless steel groove welds.

Trainee \$18.00 **ISBN 0-13-103224-0**

Instructor \$18.00 **ISBN 0-13-103236-4**

29204-03 Air Carbon Arc Cutting and Gouging (12.5 Hours)

Describes air carbon arc cutting equipment and processes. Identifies the electrodes and safe operation of the equipment. Provides step-by-step instructions for performing air carbon arc washing and gouging activities.

Trainee \$18.00 **ISBN 0-13-103225-9**

Instructor \$18.00 **ISBN 0-13-103237-2**

29205-03 Plasma Arc Cutting (PAC) (7.5 Hours)

Explains plasma arc cutting equipment and safe work area preparation. Identifies correct amperage, gas pressures, and flow rates. Covers plasma-arc cutting methods for piercing, slotting, squaring, and beveling metals. Explains how to store equipment and clean the work area.

Trainee \$18.00 **ISBN 0-13-103226-7**

Instructor \$18.00 **ISBN 0-13-103238-0**

29206-03 GMAW and FCAW – Equipment and Filler Metals (10 Hours)

Describes general safety procedures for GMAW and FCAW. Identifies GMAW and FCAW equipment and explains the filler metals and shielding gases used to perform GMAW and FCAW. Explains how to set up and use GMAW and FCAW equipment.

Trainee \$18.00 **ISBN 0-13-103228-3**

Instructor \$18.00 **ISBN 0-13-103239-9**

29207-03 GMAW and FCAW – Plate (80 Hours)

Explains how to set up GMAW and FCAW equipment and build a pad of stringer beads and weave beads using filler metals and shielding gas. Explains procedures to perform GMAW multipass fillet welds on plate in various positions.

Trainee \$18.00 **ISBN 0-13-103229-1**

Instructor \$18.00 **ISBN 0-13-103240-2**

29208-03 GTAW – Equipment and Filler Materials (10 Hours)

Explains GTAW safety. Identifies and explains the use of GTAW equipment, filler metals, and shielding gases. Covers the setup of GTAW equipment.

Trainee \$18.00 **ISBN 0-13-103230-5**

Instructor \$18.00 **ISBN 0-13-103241-0**

29209-03 GTAW – Plate (40 Hours)

Describes how to pad in all positions using GTAW and carbon steel filler metal. Covers making multi-pass V-butt open-groove welds with carbon steel filler metal in the 1G, 2G, 3G, and 4G positions.

Trainee \$18.00 **ISBN 0-13-103231-3**

Instructor \$18.00 **ISBN 0-13-103242-9**

29210-03 GTAW – Aluminum Plate (50 Elective Hours)

Covers open root V-groove welding of aluminum pipe in the 2G, 5G, and 6G positions.

Trainee \$18.00 **ISBN 0-13-103232-1**

Instructor \$18.00 **ISBN 0-13-103244-5**



Welding

Product Supplements

Computerized Testing Software ISBN 0-13-103317-4	\$30
Transparency Masters ISBN 0-13-103345-X	\$25
NEW! PowerPoint® Presentation Slides (in color) CD-ROM ISBN 0-13-602619-2	\$40
NEW! Welding Levels 1-3 Performance Labs Now all 18 of the Performance Acceptance Criteria required by AWS EG2.0-95, "Guide for the Training and Qualification of Welding Personnel—Entry Level Welder," are available in one convenient package for trainees. ISBN 0-13-604297-X	\$25

L3 WELDING

LEVEL 3

Curriculum Notes

- 362.5 Hours (262.5 required; 100 elective)
- Published: 1993 Revised: 2003
- Prepared in cooperation with AWS and supports learning objectives from the AWS Advanced & Expert Welder Programs.
- A revision is under way and due in stock Spring '10 .

PAPERBACK

Trainee Guide: \$88	ISBN 0-13-102586-4
Annotated Instructor's Guide: \$88	ISBN 0-13-102588-0

BINDER

Trainee Guide: \$93	ISBN 0-13-102587-2
Annotated Instructor's Guide: \$93	ISBN 0-13-102589-9

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

29301-03 Preheating and Postweld Heat Treatment of Metals (5 Hours)

Explains preheating, interpass temperature control, and postheating procedures that sometimes need to be done to preserve weldment strength, ductility, and weld quality. Covers the equipment used for heat treatment of metals.

Trainee \$18.00	ISBN 0-13-103245-3
Instructor \$18.00	ISBN 0-13-103255-0

29302-03 Physical Characteristics and Mechanical Properties of Metals (7.5 Hours)

Explains physical characteristics, mechanical properties, composition, and classification of common ferrous and nonferrous metals. Identifies the various standard metal forms and structural shapes. Covers visual inspection, magnetic testing, and X-ray fluorescent spectrometry methods used to identify metals.

Trainee \$18.00	ISBN 0-13-103246-1
Instructor \$18.00	ISBN 0-13-103256-9

29303-03 GMAW – Pipe (60 Hours)

Explains how to set up GMAW equipment. Covers the procedures and techniques used to make open-root V-groove welds with GMAW on pipe in the 1G-ROTATED, 2G, 5G, and 6G positions.

Trainee \$18.00	ISBN 0-13-103247-X
Instructor \$18.00	ISBN 0-13-103257-7

29304-03 FCAW – Pipe (60 Hours)

Explains how to set up FCAW equipment. Covers the procedures and techniques used to make V-groove pipe welds with FCAW in the 1G-ROTATED, 2G, 5G, and 6G positions.

Trainee \$18.00	ISBN 0-13-103248-8
Instructor \$18.00	ISBN 0-13-103258-5

29305-03 GTAW – Carbon Steel Pipe (60 Hours)

Explains how to set up GTAW equipment. Covers the procedures and techniques used to make V-groove pipe welds with GTAW in the 1G-ROTATED, 2G, 5G, and 6G positions for carbon steel pipe.

Trainee \$18.00	ISBN 0-13-103249-6
Instructor \$18.00	ISBN 0-13-103259-3

29306-03 GTAW – Low-Alloy and Stainless Steel Pipe (70 Hours)

Explains how to set up GTAW equipment. Covers the procedures and techniques used to make V-groove pipe welds with GTAW in the 2G, 5G, and 6G positions for low-alloy and stainless steel pipe.

Trainee \$18.00	ISBN 0-13-103251-8
Instructor \$18.00	ISBN 0-13-103260-7

29307-03 GTAW – Aluminum Pipe (50 Elective Hours)

Explains how to set up GTAW equipment. Covers the procedures and techniques used to make V-groove pipe welds with GTAW in the 2G, 5G, and 6G positions for aluminum pipe.

Trainee \$18.00	ISBN 0-13-103253-4
Instructor \$18.00	ISBN 0-13-103262-3

29308-03 GMAW – Aluminum Plate and Pipe (50 Elective Hours)

Explains how to set up GMAW equipment and build a pad of stringer beads and weave beads using aluminum filler metals and shielding gas. Provides procedures for performing GMAW multiple-pass fillet welding on aluminum plate in the 1F, 2F, 3F, and 4F positions. Covers making GMAW V-groove welds with backing for aluminum plate in the 1G, 2G, 3G, and 4G positions and aluminum pipe in the 1G-ROTATED, 2G, 5G, and 6G positions.

Trainee \$18.00	ISBN 0-13-103254-2
Instructor \$18.00	ISBN 0-13-103263-1

Product Supplements

Computerized Testing Software ISBN 0-13-103319-0	\$30
Transparency Masters ISBN 0-13-103346-8	\$25
NEW! PowerPoint® Presentation Slides (in color) CD-ROM ISBN 0-13-602620-6	\$40
NEW! Welding Levels 1-3 Performance Labs Now all 18 of the Performance Acceptance Criteria required by AWS EG2.0-95, "Guide for the Training and Qualification of Welding Personnel—Entry Level Welder," are available in one convenient package for trainees. ISBN 0-13-604297-X	\$25

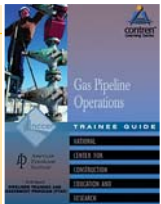


Gas Pipeline Operations

PTAP

The American Petroleum Institute (API) and the National Center for Construction Education and Research (NCCER) have joined forces to create the Pipeliner Training and Assessment Program (PTAP). The PTAP consists of Pipeline Curriculum and Skills Assessments to qualify pipeline personnel under the Department of Transportation's (DOT) regulation for Pipeline Operator Qualification (OQ). The Pipeline Skills Assessments link to NCCER's standardized Pipeline Curriculum and are a significant method to help determine operator qualifications on selected Covered Tasks as identified by API and the Pipeline Industry. For more information on the Pipeline Skills Assessments, contact NCCER Customer Service at 1-888-NCCER20.

L1 GAS PIPELINE OPERATIONS



LEVEL 1

Curriculum Notes

- 197.5 Hours (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046671-9**
 Annotated Instructor's Guide: \$100 **ISBN 0-13-046672-7**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

66101-02 Introduction to the Pipeline Industry (Pipeline Core) (15 Hours)

Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee \$20.00 **ISBN 0-13-038223-X**
 Instructor \$20.00 **ISBN 0-13-038234-5**

67102-02 Basic Pipeline Pneumatics and Equipment (10 Hours)

Introduces the basics of pneumatic equipment. Topics include pneumatic safety and the physical characteristics of gas. A discussion of compressors, valves, meters, and other pipeline equipment and an overview on pipeline design also are included.

Trainee \$20.00 **ISBN 0-13-038244-2**
 Instructor \$20.00 **ISBN 0-13-038251-5**

67103-02 Pipeline Communications (10 Hours)

Stresses the importance of clear communication between pipeline employees. Topics include issuing work orders and callouts, communications between shifts, and communications with regulatory agencies and the general public. Focuses on the importance of communication to safety, customer service, and the company's reputation.

Trainee \$20.00 **ISBN 0-13-038245-0**
 Instructor \$20.00 **ISBN 0-13-038252-3**

67104-02 Routine Field and Facility Operations (CT 43, 50, 51, 54, 56, 57, 58, and 65) (30 Hours)

Provides an overview of the daily tasks performed in the field and the pipeline facility. Topics include performing routine facility inspections, operating valves and compressors, purging the pipeline, testing remote control shutdown devices, operating odorant equipment and monitoring odorant level (when applicable), uprating the pipeline MAOP, performing system startup and shutdown, and pigging.

Trainee \$20.00 **ISBN 0-13-038247-7**
 Instructor \$20.00 **ISBN 0-13-038254-X**

67105-02 Routine Control Center Operations (CT 43, 50, 51, 54, 56, 57, 58, and 65) (30 Hours)

Provides an overview of the daily tasks performed in a pipeline's control center, including the use of the SCADA system. Topics include manifold and compressor operations, system startup and shutdown, pigging, purging pipelines, testing remote control shutdown devices, uprating the MAOP, and operating odorant equipment and monitoring odorant level (when applicable).

Trainee \$20.00 **ISBN 0-13-038246-9**
 Instructor \$20.00 **ISBN 0-13-038253-1**

67106-02 Quality Control and Measurement (20 Hours)

Focuses on the importance of quality control and accurate measurement as they affect safety, customer service, and the company's reputation. Topics include taking samples, performing product testing, and product testing and measurement tools.

Trainee \$20.00 **ISBN 0-13-038240-X**
 Instructor \$20.00 **ISBN 0-13-038257-4**

67107-02 Abnormal Operating Conditions (10 Hours)

Provides an overview of the types of abnormal operating conditions (AOCs) that may occur on the pipeline or in company facilities. Appropriate responses to AOCs are covered with a focus on following company policy to protect lives and pipeline equipment. Also covered are the reports required by federal law.

Trainee \$20.00 **ISBN 0-13-038265-5**
 Instructor \$20.00 **ISBN 0-13-038275-2**

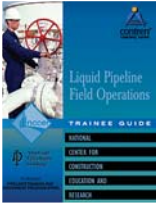
Product Supplements

Computerized Testing Software ISBN 0-13-038429-1	\$30
Transparency Masters ISBN 0-13-038417-8	\$25

Liquid Pipeline Field Operations

L1 LIQUID PIPELINE FIELD OPERATIONS

LEVEL 1



Curriculum Notes

- 195 Hours (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046669-7**
 Annotated Instructor's Guide: \$100 **ISBN 0-13-046660-3**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

66101-02 Introduction to the Pipeline Industry (Pipeline Core) (15 Hours)

Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee \$20.00 **ISBN 0-13-038223-X**
 Instructor \$20.00 **ISBN 0-13-038234-5**

66102-02 Liquid Pipeline General Abnormal Operating Conditions (Pipeline Core) (5 Hours)

Introduces the Abnormal Operating Conditions (AOCs) that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to AOCs and the necessary documentation and notifications that must be completed when responding to AOCs.

Trainee \$20.00 **ISBN 0-13-038224-8**
 Instructor \$20.00 **ISBN 0-13-038235-3**

60102-02 Basic Pipeline Hydraulics and Equipment (10 Hours)

Explains pipeline hydraulics safety, basic principles of hydraulic systems, hydraulic properties of petroleum products, pipeline design factors, and basic pipeline equipment.

Trainee \$20.00 **ISBN 0-13-038226-4**
 Instructor \$20.00 **ISBN 0-13-038236-1**

60103-02 Pipeline Communications (7.5 Hours)

Introduces the various channels of communications that must exist in pipeline operations, including internal communications with scheduling, operations, and maintenance, and external communications with contractors, the general public, regulatory agencies, and local, state, and federal government.

Trainee \$20.00 **ISBN 0-13-038227-2**
 Instructor \$20.00 **ISBN 0-13-038237-X**

60104-02 Product Batch and Pig Tracking (10 Hours)

Describes how to track pipeline product line inventories; handle scheduled pipeline shipments; identify product interface changes; and launch, receive, and track pigs through the pipeline and facility.

Trainee \$20.00 **ISBN 0-13-038228-0**
 Instructor \$20.00 **ISBN 0-13-038238-8**

60105-02 Routine Field and Facility Operations (CT 43.1, 43.2, 43.4, 63.1, 63.2, and 63.4) (25 Hours)

Explains how to perform visual facility checks and verify tank capacity and availability. Provides procedures for operating valves; facility pumping equipment; pressure, flow, and temperature controllers; and terminal storage tanks. Also provides information relating to custody transfers, setting alarm parameters, performing start-up and shutdown procedures, performing batch switches, calculating facility over-and-short, and completing required operations documentation.

Trainee \$20.00 **ISBN 0-13-038229-9**
 Instructor \$20.00 **ISBN 0-13-038239-6**

60106-02 Monitoring Pipeline Operations (CT 43.3 and 63.3) (15 Hours)

Explains how to monitor pipeline parameters, recognize and react to safety device alarms, purge product from the pipe, perform pipeline surveillance, and monitor weather conditions.

Trainee \$20.00 **ISBN 0-13-038220-5**
 Instructor \$20.00 **ISBN 0-13-038230-2**

60107-02 Field Quality Control (15 Hours)

Introduces field quality control procedures including activation of tank mixing devices, collection of product samples, product testing, pipeline switching, product blending operations, and injection of appropriate additives.

Trainee \$20.00 **ISBN 0-13-038231-0**
 Instructor \$20.00 **ISBN 0-13-038242-6**

60108-02 Field Measurement (20 Hours)

Introduces the techniques used in field measurement of products in the pipeline. Areas covered include measurement components, types of meters, measurement of custody transfers and receipts, verification of meter accuracy, waterdraw calibration techniques, and utilization of tank strappings.

Trainee \$20.00 **ISBN 0-13-038232-9**
 Instructor \$20.00 **ISBN 0-13-038243-4**

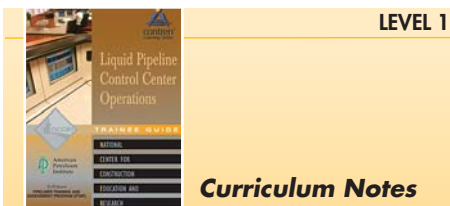
Product Supplements	
Computerized Testing Software ISBN 0-13-038428-3	\$30
Transparency Masters ISBN 0-13-038416-X	\$25





Liquid Pipeline Control Center Operations

L1 LIQUID PIPELINE CONTROL CENTER OPERATIONS



LEVEL 1

Curriculum Notes

- 195 Hours (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046674-3**
 Annotated Instructor's Guide: \$100 **ISBN 0-13-046675-1**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

66101-02 Introduction to the Pipeline Industry (*Pipeline Core*) (15 Hours)

Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee \$20.00 **ISBN 0-13-038223-X**
 Instructor \$20.00 **ISBN 0-13-038234-5**

65102-02 Control Center Abnormal Operating Conditions (5 Hours)

Introduces the trainee to the abnormal operating conditions that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to abnormal operating conditions from the control center and the necessary documentation and notifications that must be completed when responding to abnormal operating conditions.

Trainee \$20.00 **ISBN 0-13-038267-1**
 Instructor \$20.00 **ISBN 0-13-038276-0**

65103-02 Basic Pipeline Hydraulics and Equipment (10 Hours)

Explains pipeline hydraulics safety, basic principles of hydraulic systems, hydraulic properties of petroleum products, pipeline design factors, and basic pipeline equipment.

Trainee \$20.00 **ISBN 0-13-038259-0**
 Instructor \$20.00 **ISBN 0-13-038268-X**

65104-02 Pipeline Communications (7.5 Hours)

Introduces the various channels of communication that must exist in pipeline operations, including internal communications with scheduling, operations, and maintenance, and external communications with contractors, the general public, regulatory agencies, and local, state, and federal government.

Trainee \$20.00 **ISBN 0-13-038261-2**
 Instructor \$20.00 **ISBN 0-13-038260-4**

65105-02 Monitoring Pipeline Operations – Control Center (*CT 43.3 and 64.3*) (30 Hours)

Introduces the concepts, theories, and applications of the SCADA computer system. Explains how to monitor and prioritize the various alarms and functionalities of the SCADA system, perform pipeline system and pipeline station monitoring activities with the SCADA system, and document pipeline activities with the SCADA system.

Trainee \$20.00 **ISBN 0-13-038262-0**
 Instructor \$20.00 **ISBN 0-13-038271-X**

65106-02 Routine Control Center Operations (*CT 43.1, 43.2, 43.4, 64.1, 64.2, and 64.4*) (35 Hours)

Introduces the theories, concepts, and operation of tanks and explains how to perform pump and manifold operations. Also explains how to start up and shut down a pipeline system through the control center.

Trainee \$20.00 **ISBN 0-13-038263-9**
 Instructor \$20.00 **ISBN 0-13-038272-8**

65107-02 Liquid Pipeline Measurement and Quality Control (20 Hours)

Explains how to activate tank mixing devices, perform product testing, and perform pipeline grade changes and tank capacity operations. Also explains how to use and inject appropriate additives, identify types of meters, maintain accurate measurement on all custody receipts, and the processes and techniques used to prove meters.

Trainee \$20.00 **ISBN 0-13-038264-7**
 Instructor \$20.00 **ISBN 0-13-038273-6**

Product Supplements

Computerized Testing Software ISBN 0-13-038420-8	\$30
Transparency Masters ISBN 0-13-038418-6	\$25





Pipeline Corrosion Control

L1 PIPELINE CORROSION CONTROL

LEVEL 1



Curriculum Notes

- 160 Hours (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046684-0**
 Annotated Instructor's Guide: \$100 **ISBN 0-13-046685-9**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

66101-02 Introduction to the Pipeline Industry (Pipeline Core) (15 Hours)

Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee \$20.00 **ISBN 0-13-038223-X**
 Instructor \$20.00 **ISBN 0-13-038234-5**

66102-02 Liquid Pipeline General Abnormal Operating Conditions (Pipeline Core) (5 Hours)

Introduces the Abnormal Operating Conditions (AOCs) that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to AOCs and the necessary documentation and notifications that must be completed when responding to AOCs.

Trainee \$20.00 **ISBN 0-13-038224-8**
 Instructor \$20.00 **ISBN 0-13-038235-3**

61103-02 Locating Pipeline and Cable (CT 14.1 and 17.1) (5 Hours)

Identifies and explains One-Call notification systems and the methods used to locate pipe and cable. Also discusses the requirements for separations between underground structures, abnormal operating conditions (AOCs), and first responders.

Trainee \$20.00 **ISBN 0-13-038277-9**
 Instructor \$20.00 **ISBN 0-13-038287-6**

61104-02 Measure Pit Depth and Wall Thickness (CT 8.1, 8.2, and 8.3) (5 Hours)

Explains how to use pit gauges to check pit depth, length, and profile. Describes how to take multiple readings for RSTRENG data and how to use ultrasonic meters to check pipewall thickness.

Trainee \$20.00 **ISBN 0-13-038278-7**
 Instructor \$20.00 **ISBN 0-13-038288-4**

61105-02 Inspect Buried and Submerged Pipe When Exposed (CT 5.1, 5.2, and 5.3) (5 Hours)

Identifies and explains types of pipe coatings. Describes the different causes of coating damage. Covers inspecting pipe for corrosion and mechanical damage.

Trainee \$20.00 **ISBN 0-13-038279-5**
 Instructor \$20.00 **ISBN 0-13-038289-2**

61106-02 Aboveground Pipe Coating and Inspection (CT 7.1, 7.2, 7.3, 7.5, 13.1 and 13.2) (15 Hours)

Describes aboveground pipe coating types and the causes of coating damage. Describes how to visually inspect aboveground pipe. Explains how to perform surface preparation and coating application for aboveground pipe.

Trainee \$20.00 **ISBN 0-13-038270-1**
 Instructor \$20.00 **ISBN 0-13-038280-9**

61107-02 Apply and Repair External Coatings on Buried and Submerged Pipe (CT 13.1 and 13.4) (10 Hours)

Identifies and explains the desired qualities of buried pipe coatings. Explains surface preparation and coating application for buried/submerged pipe. Describes performing field coating repairs.

Trainee \$20.00 **ISBN 0-13-038281-7**
 Instructor \$20.00 **ISBN 0-13-038291-4**

61108-02 Cathodic Protection Measurement (CT 1.1, 1.5, 3.1, and 3.2) (7.5 Hours)

Explains the basic theory of cathodic protection and the methods used to provide protection. Describes the instrumentation and meters used in cathodic protection. Identifies and explains half cell inspection and measuring structure to soil potential.

Trainee \$20.00 **ISBN 0-13-038283-3**
 Instructor \$20.00 **ISBN 0-13-038292-2**

61109-02 Test Station Repair (CT 2.1, 2.2, 2.3, and 2.4) (5 Hours)

Identifies and explains the types and construction of test stations. Describes how to repair aboveground and belowground test stations. Explains the methods used to attach test station wires to pipe.

Trainee \$20.00 **ISBN 0-13-038284-1**
 Instructor \$20.00 **ISBN 0-13-038293-0**

61110-02 Inspect Internal Pipe Surfaces (CT 12) (7.5 Hours)

Describes using ultrasonic gauges to check pipe wall thickness and pit gauges to check pit dimensions. Discusses how to establish pipe orientation and document the findings from wall thickness and pit dimension checks.

Trainee \$20.00 **ISBN 0-13-038285-X**
 Instructor \$20.00 **ISBN 0-13-038294-9**

61111-02 Internal Corrosion Control (CT 10.1, 10.2, and 11) (7.5 Hours)

Explains how corrosion monitoring probes operate and the information that is collected. Describes using corrosion measurement tools and accurately recording the measurements obtained.

Trainee \$20.00 **ISBN 0-13-038286-8**
 Instructor \$20.00 **ISBN 0-13-038295-7**

Product Supplements

Computerized Testing Software ISBN 0-13-038432-1	\$30
Transparency Masters ISBN 0-13-038419-4	\$25

L2 PIPELINE CORROSION CONTROL

LEVEL 2

Curriculum Notes

- 120 Hours
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046686-7**
 Annotated Instructor's Guide: \$100 **ISBN 0-13-046687-5**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

61201-02 Install Cathodic Protection Systems (CT 9.2, 9.3, and 9.4) (15 Hours)

Describes requirements for planning a CP system, explains how to select components, and describes installation techniques for galvanic and impressed current systems. Includes rectifier installation.

Trainee \$20.00 **ISBN 0-13-038296-5**
 Instructor \$20.00 **ISBN 0-13-038302-3**

61202-02 Maintain and Repair Rectifiers (CT 4) (15 Hours)

Describes the characteristics of CP rectifiers and the functions of rectifier components. Describes troubleshooting techniques for rectifiers and bonds, as well as repair and adjustment procedures for rectifiers.

Trainee \$20.00 **ISBN 0-13-038297-3**
 Instructor \$20.00 **ISBN 0-13-038303-1**

Pipeline Corrosion Control

61203-02 Mitigate Interference

(CT 1.3 and 9.1) (15 Hours)

Identifies the sources of interference current in a CP system, including causes and testing. Describes mitigation and reduction techniques for a CP system, including bonds, coating, galvanic anodes, and electrical shields.

Trainee \$20.00 **ISBN 0-13-038298-1**
 Instructor \$20.00 **ISBN 0-13-038304-X**

61204-02 Test and Repair Shorted Casings

(CT 9.5) (15 Hours)

Explains testing casings, including causes of shorted casings, how to recognize them, and various tests for shorted casing conditions. Explains the repair of shorted casings, including replacing components.

Trainee \$20.00 **ISBN 0-13-038299-X**
 Instructor \$20.00 **ISBN 0-13-038305-8**

61205-02 Conduct Close Interval Survey

(CT 1.2 and 1.4) (15 Hours)

Identifies common close interval survey equipment, including test lead reels, current interrupters, and data logger and reference electrodes. Describes continuous and interrupted close interval survey methods and the procedure for performing such a survey.

Trainee \$20.00 **ISBN 0-13-038301-5**
 Instructor \$20.00 **ISBN 0-13-038306-6**

61206-02 Perform Coating Inspection

(CT 7.7) (15 Hours)

Describes required pre-inspection activities, including surface preparation, degree of cleanliness, profile, and coating mixing, thickness, adhesion, and curing. Describes holiday and pinhole testing and causes of coating failures, including application problems, specifications, and diagnosis.

Trainee \$20.00 **ISBN 0-13-038248-5**
 Instructor \$20.00 **ISBN 0-13-038255-8**

61207-02 Perform High-Pressure Blasting/ Surface Preparation

(CT 7.4 and 13.3) (15 Hours)

Explains basic abrasive blast system equipment and describes the characteristics of blast cleaning media. Explains preparation standards, including profiling and inspections. Describes chemical strippers.

Trainee \$20.00 **ISBN 0-13-038249-3**
 Instructor \$20.00 **ISBN 0-13-038256-6**

61208-02 Apply Coatings Using Spray Applications

(CT 7.6 and 13.5) (15 Hours)

Describes types of paint and coating materials, including pigments, resins, solvents, and additives, including film-forming and generic coatings and powder coatings. Explains surface preparation, application, and testing. Describes air, electrostatic, and thermal spray systems.

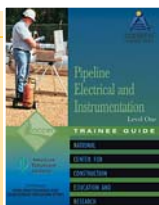
Trainee \$20.00 **ISBN 0-13-038250-7**
 Instructor \$20.00 **ISBN 0-13-038269-8**

Product Supplements

Computerized Testing Software ISBN 0-13-038433-X	\$30
Transparency Masters ISBN 0-13-038410-0	\$25

Pipeline Electrical & Instrumentation

L1 PIPELINE ELECTRICAL & INSTRUMENTATION



LEVEL 1

Curriculum Notes

- 287.5 Hours (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046688-3**
 Annotated Instructor's Guide: \$100 **ISBN 0-13-046689-1**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

66101-02 Introduction to the Pipeline Industry

(Pipeline Core) (15 Hours)

Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee \$20.00 **ISBN 0-13-038223-X**
 Instructor \$20.00 **ISBN 0-13-038234-5**

66102-02 Liquid Pipeline General Abnormal Operating Conditions

(Pipeline Core) (5 Hours)

Introduces the Abnormal Operating Conditions (AOCs) that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to AOCs and the necessary documentation and notifications that must be completed when responding to AOCs.

Trainee \$20.00 **ISBN 0-13-038224-8**
 Instructor \$20.00 **ISBN 0-13-038235-3**

64102-02 Pipeline E&I Safety

(15 Hours)

Describes the types and uses of personal protective equipment and covers hazard communications. Identifies and explains lockout/tagout and MSDS requirements. Covers safety related tools, safety rules and regulations, and work site hazards.

Trainee \$20.00 **ISBN 0-13-038376-7**
 Instructor \$20.00 **ISBN 0-13-038385-6**

64103-02 Trade Math

(40 Hours)

Identifies and explains instrumentation formulas and equations. Explains how to calculate load and ampacity. Also describes conductors and performing pipeline-specific E&I calculations.

Trainee \$20.00 **ISBN 0-13-038377-5**
 Instructor \$20.00 **ISBN 0-13-038386-4**

64104-02 Electrical Theory

(40 Hours)

Offers a general introduction to the electrical concepts used in Ohm's law as applied to DC series circuits. Includes atomic theory, electromotive force, resistance, and electric power equations. Also introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchoff's voltage and current laws, and circuit analysis.

Trainee \$20.00 **ISBN 0-13-038378-3**
 Instructor \$20.00 **ISBN 0-13-038387-2**

64105-02 Tools of the Trade

(15 Hours)

Identifies and explains the types of hand tools used in the pipeline E&I trade. Also explains trade-specific power tools, test equipment, and communication equipment.

Trainee \$20.00 **ISBN 0-13-038379-1**
 Instructor \$20.00 **ISBN 0-13-038388-0**



Pipeline Electrical & Instrumentation

64106-02 Pipeline Operations (40 Hours)

Describes pipeline system hydraulics and ANSI ratings and standards. Explains station control systems and recognizing and responding to AOCs. Also covers pigging operations and proving process meters.

Trainee \$20.00 **ISBN 0-13-038370-8**
Instructor \$20.00 **ISBN 0-13-038389-9**

64107-02 Pipeline E&I Drawings (30 Hours)

Identifies and explains drawing classifications and written specifications. Describes the uses of electrical drawings and piping and instrumentation drawings. Also covers special drawings and documentation as well as pipeline maps and alignment sheets.

Trainee \$20.00 **ISBN 0-13-038382-1**
Instructor \$20.00 **ISBN 0-13-038380-5**

64108-02 Understanding the National Electrical Code® (7.5 Hours)

Provides a navigational road map for using the NEC®. Introduces trainees to the layout of the NEC® and the types of information found within the code book. Presents an easy-to-follow procedure for finding information in the NEC®.

Trainee \$20.00 **ISBN 0-13-038383-X**
Instructor \$20.00 **ISBN 0-13-038391-0**

64109-02 Fasteners and Anchors (7.5 Hours)

Introduces the hardware and systems used to mount and support boxes, receptacles, and other electrical components. Covers the various types of anchors and supports, their applications, and their safe installation.

Trainee \$20.00 **ISBN 0-13-038384-8**
Instructor \$20.00 **ISBN 0-13-038392-9**

Product Supplements

Computerized Testing Software ISBN 0-13-038438-0	\$30
Transparency Masters ISBN 0-13-038426-7	\$25

L2 PIPELINE ELECTRICAL & INSTRUMENTATION

LEVEL 2

Curriculum Notes

- 265 Hours
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046691-3**
Annotated
Instructor's Guide: \$100 **ISBN 0-13-046692-1**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

64201-02 Electrical Installations in Classified Areas (40 Hours)

Explains Class I, II, III, and IV pipeline areas. Describes intrinsically safe devices and systems and their ratings. Also covers allowable conduits and fittings, and explosion-proof enclosures. Explains safe work practices in classified areas, including barriers, PPE, monitoring requirements, and gas detectors.

Trainee \$20.00 **ISBN 0-13-038393-7**
Instructor \$20.00 **ISBN 0-13-038404-6**

64202-02 Use of Meters and Test Equipment (15 Hours)

Explains general, personal, and test equipment for E&I safety. Explains measuring current, voltage, and resistance and the types of meters used. Includes specialty instruments such as calibrators, simulators, and gauges. Includes sections on oscilloscope operation, waveform characteristics, and measurement techniques.

Trainee \$20.00 **ISBN 0-13-038394-5**
Instructor \$20.00 **ISBN 0-13-038405-4**

64203-02 Grounding (30 Hours)

Explains grounding basics, system types, NEC® requirements, equipment grounding, and how to bond service equipment. Includes discussion of effective grounding paths, conductors, separately derived systems, grounding at more than one building, and systems over 1,000 volts. Describes how to test grounding and measure earth resistance, three-point testing, and tank grounding.

Trainee \$20.00 **ISBN 0-13-038395-3**
Instructor \$20.00 **ISBN 0-13-038406-2**

64204-02 Process Control Theory (40 Hours)

Explains process characteristics and control systems. Describes control loop components and control loops and modes. Includes discussion of the types of control applications, including temperature, pressure, flow, and level control.

Trainee \$20.00 **ISBN 0-13-038396-1**
Instructor \$20.00 **ISBN 0-13-038408-9**

64205-02 Supervisory Control Systems (15 Hours)

Explains pipeline supervisory control systems, PLCs, HMIs, and RTUs. Describes data highways and protocols, including data transfer methods, and SCADA-related communications, including transfer media, wireless radios, and Ethernet, and transmission and interface methods.

Trainee \$20.00 **ISBN 0-13-038397-X**
Instructor \$20.00 **ISBN 0-13-038409-7**

64206-02 Switches and Transmitters (CT 25, 30, 31) (15 Hours)

Discusses pipeline pressure, flow, level, and temperature switches and pneumatic, electronic, and optical transmitters. Explains how to test, repair, inspect, and maintain switches and transmitters. Describes pigs and sphere detectors and recorders. Explains DOT coverage and regulations.

Trainee \$20.00 **ISBN 0-13-038398-8**
Instructor \$20.00 **ISBN 0-13-038400-3**

64207-02 Controllers (CT 26) (15 Hours)

Explains control and PID loops and verifying and setting protection parameters. Includes information on proper procedures and potential AOCs. Explains how to troubleshoot and tune open and closed loops.

Trainee \$20.00 **ISBN 0-13-038390-2**
Instructor \$20.00 **ISBN 0-13-038411-9**

64208-02 Valve Actuators (CT 19.5) (15 Hours)

Explains valve actuator components, including switches, power mechanisms, and heaters. Describes valve actuator types, symbols and schematics, uses, and actuator interfaces. Describes setting valve limits, and installing, repairing, and maintaining actuators.

Trainee \$20.00 **ISBN 0-13-038401-1**
Instructor \$20.00 **ISBN 0-13-038412-7**

64209-02 Product Measurement (CT 44.1, 44.2) (40 Hours)

Explains custody transfer and how to test, repair, install, and maintain custody transfer equipment and devices. Covers testing, repairing, installing, and maintaining prover equipment, process measurement equipment, and flow measurement equipment.

Trainee \$20.00 **ISBN 0-13-038402-X**
Instructor \$20.00 **ISBN 0-13-038413-5**

64210-02 Analytical Equipment (CT 55) (40 Hours)

Identifies many types of pipeline analytical equipment. Explains the maintenance of hydrogen sulfide and sulfur analyzers. Explains how to maintain chromatographs, moisture analyzers, vapor and combustible gas detectors, continuous emissions monitoring systems, and centrifuges.

Trainee \$20.00 **ISBN 0-13-038403-8**
Instructor \$20.00 **ISBN 0-13-038415-1**

Product Supplements

Computerized Testing Software ISBN 0-13-038439-9	\$30
Transparency Masters ISBN 0-13-038427-5	\$25



Pipeline Electrical & Instrumentation

L3 PIPELINE ELECTRICAL & INSTRUMENTATION

LEVEL 3

Curriculum Notes

- 185 Hours
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-101082-4**
 Annotated Instructor's Guide: \$100 **ISBN 0-13-101083-2**

MODULES
 All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

64301-02 Transformers (25 Hours)
 Describes power systems, explains transformer construction, taps, installation requirements, and connections. Describes power distribution, instruments, control, and isolation transformer types. Explains transformer maintenance and testing.
 Trainee \$20.00 **ISBN 0-13-103140-6**
 Instructor \$20.00 **ISBN 0-13-103148-1**

64302-02 Switchgear and MCCs (25 Hours)
 Explains power factor and medium versus low-voltage cable and MCCs. Describes types of switchgear and cables, feeders, bussing, and bracing. Includes testing and maintenance on switchgear and MCCs and associated components.
 Trainee \$20.00 **ISBN 0-13-103141-4**
 Instructor \$20.00 **ISBN 0-13-103149-X**

64303-02 Low-Voltage and Standby Power (25 Hours)
 Explains pipeline system standby generators, batteries, chargers, inverters, converters, and rotary and static UPSs. Also addresses the maintenance and testing of each.
 Trainee \$20.00 **ISBN 0-13-103142-2**
 Instructor \$20.00 **ISBN 0-13-103150-3**

64304-02 Power Quality (25 Hours)
 Explains power quality and types of defects, power systems, protection, and conditioning equipment. Discusses types of electrical noise and related problems, and possible solutions. Explains static electricity and its effect, system verification testing, and equipment maintenance.
 Trainee \$20.00 **ISBN 0-13-103143-0**
 Instructor \$20.00 **ISBN 0-13-103152-X**

64305-02 Prime Movers (32.5 Hours)
 Describes various electric motors and drives and their components. Discusses their maintenance and testing. Explains engine types, cooling and lubrication systems, turbine operation, fuel sources, and controls.
 Trainee \$20.00 **ISBN 0-13-103145-7**
 Instructor \$20.00 **ISBN 0-13-103153-8**

64306-02 Facility Auxiliary Systems (22.5 Hours)
 Includes information on pipeline facility buildings and related systems. Systems covered include: fire, security, vapor recovery, injection, water treatment, cathodic protection, and blending systems.
 Trainee \$20.00 **ISBN 0-13-103146-5**
 Instructor \$20.00 **ISBN 0-13-103154-6**

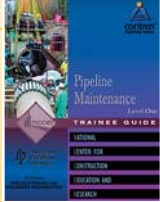
64307-02 SCADA (30 Hours)
 Explains pipeline operations systems, including control, communications, SCADA, and PLCs. Explains redundant systems and control system troubleshooting.
 Trainee \$20.00 **ISBN 0-13-103147-3**
 Instructor \$20.00 **ISBN 0-13-103155-4**

Product Supplements	
Computerized Testing Software ISBN 0-13-103325-5	\$30
Transparency Masters ISBN 0-13-103327-1	\$25

Pipeline Maintenance

L1 PIPELINE MAINTENANCE

LEVEL 1



Curriculum Notes

- 157.5 Hours (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046676-X**
 Annotated Instructor's Guide: \$100 **ISBN 0-13-046677-8**

MODULES
 All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

66101-02 Introduction to the Pipeline Industry (Pipeline Core) (15 Hours)
 Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.
 Trainee \$20.00 **ISBN 0-13-038223-X**
 Instructor \$20.00 **ISBN 0-13-038234-5**

66102-02 Liquid Pipeline General Abnormal Operating Conditions (Pipeline Core) (5 Hours)
 Introduces the Abnormal Operating Conditions (AOCs) that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to AOCs and the necessary documentation and notifications that must be completed when responding to AOCs.
 Trainee \$20.00 **ISBN 0-13-038224-8**
 Instructor \$20.00 **ISBN 0-13-038235-3**

62103-02 Release Identification and Response (7.5 Hours)
 Describes company environmental manuals and the DNR and EPA regulations. Explains the NRC and Coast Guard responsibilities and spill prevention. Identifies and explains soil contamination, release reporting and containment, hydrostatic testing, flaring/venting, and trash handling.
 Trainee \$20.00 **ISBN 0-13-038307-4**
 Instructor \$20.00 **ISBN 0-13-038314-7**



Pipeline Maintenance

62104-02 Tools of the Trade (10 Hours)

Explains use and care of the hand and power tools that are used in the pipeline industry. Describes the use of welding equipment and meters and testers. Also explains nondestructive testing and the uses of hydraulic cranes and heavy excavating equipment.

Trainee \$20.00 **ISBN 0-13-038309-0**

Instructor \$20.00 **ISBN 0-13-038315-5**

62105-02 Pipeline Documentation (15 Hours)

Identifies and explains the alignment sheets used in the pipeline industry including maps, P&IDs, and electrical drawings. Also describes the types of documentation and document management required in the industry.

Trainee \$20.00 **ISBN 0-13-038311-2**

Instructor \$20.00 **ISBN 0-13-038317-1**

62106-02 Preventing Pipeline Damage

(CT 14 and 28) (15 Hours)

Describes the one-call system and how it is used to prevent pipeline damage. Identifies and explains the methods used to prevent third-party and employee-caused pipeline damage. Explains the importance of public awareness. Includes placing and maintaining permanent line markers and providing security for pipeline facilities.

Trainee \$20.00 **ISBN 0-13-038312-0**

Instructor \$20.00 **ISBN 0-13-038318-X**

62107-02 Excavating and Backfilling

(CT 17 and 39) (17.5 Hours)

Explains OSHA requirements and methods for locating and marking pipelines. Identifies the permits required and the procedures for exposing pipe and performing damage inspection. Describes reporting defects, water inspections, and backfilling.

Trainee \$20.00 **ISBN 0-13-038313-9**

Instructor \$20.00 **ISBN 0-13-038319-8**

Product Supplements

Computerized Testing Software ISBN 0-13-038434-8	\$30
Transparency Masters ISBN 0-13-038421-6	\$25

L2 PIPELINE MAINTENANCE

LEVEL 2

Curriculum Notes

- 155 Hours
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046678-6**

Annotated Instructor's Guide: \$100 **ISBN 0-13-046679-4**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

62201-02 Right-of-Way Inspection

(CT 15 and 16) (20 Hours)

Discusses procedures for inspections of pipeline right-of-way. Explains navigable water crossing inspection. Contains information on methods of patrol for pipeline right-of-way inspections on land, including reportable observations and reporting protocol.

Trainee \$20.00 **ISBN 0-13-038310-4**

Instructor \$20.00 **ISBN 0-13-038328-7**

62202-02 Facility Inspection (CT 27) (17.5 Hours)

Covers inspection of pipeline facilities, including security systems and other building systems. Also discusses inspections of tanks and tank farms.

Trainee \$20.00 **ISBN 0-13-038321-X**

Instructor \$20.00 **ISBN 0-13-038329-5**

62203-02 Valve Inspection (CT 20) (22.5 Hours)

Introduces and explains the operation of different types of valves. Includes information on valves that start and stop flow, regulate flow and pressure, relieve pressure, and regulate direction of flow. Discusses procedures for inspecting valves and performing some basic preventative maintenance on valves.

Trainee \$20.00 **ISBN 0-13-038322-8**

Instructor \$20.00 **ISBN 0-13-038320-1**

62204-02 Pipeline Coating Inspection

(CT 5) (20 Hours)

Explains different types of pipeline coatings available, and some methods of application. Introduces some basic pipeline coating problems, and inspection of pipeline coating.

Trainee \$20.00 **ISBN 0-13-038323-6**

Instructor \$20.00 **ISBN 0-13-038331-7**

62205-02 Pipe Inspection and Nondestructive Testing (CT 38.1, 38.2, and 38.3) (25 Hours)

Outlines methods of pipe inspection for liquid petroleum pipelines. Discusses requirements for visual inspections of pipe, pipe components, and welds on pipe. Also discusses different methods of nondestructive testing and evaluation on pipelines, including liquid penetrant, magnetic particle, ultrasonic, and radiographic tests. Procedures for verifying nondestructive weld tests and verifying that the weld meets mandated requirements are also given.

Trainee \$20.00 **ISBN 0-13-038325-2**

Instructor \$20.00 **ISBN 0-13-038333-3**

62206-02 Pipeline Maintenance

(CT 18 and 52) (32.5 Hours)

General discussion of some basic pipeline maintenance issues. Includes information and procedures on locating underground structures on the pipeline, maintaining the pipeline route, excavating utilities and pipeline components safely and properly, applying coating, tightening flanges, running maintenance pigs, and performing leak surveys on liquid and gas pipelines.

Trainee \$20.00 **ISBN 0-13-038326-0**

Instructor \$20.00 **ISBN 0-13-038334-1**

62207-02 Hydrostatic Testing (CT 41) (17.5 Hours)

Explains the principles and requirements of hydrostatic testing on pipelines. Explains necessary preparations for testing, and describes the testing procedures.

Trainee \$20.00 **ISBN 0-13-038327-9**

Instructor \$20.00 **ISBN 0-13-038335-X**

Product Supplements

Computerized Testing Software ISBN 0-13-038435-6	\$30
Transparency Masters ISBN 0-13-038422-4	\$25

L3 PIPELINE MAINTENANCE

LEVEL 3

Curriculum Notes

- 202.5 Hours
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-101077-8**

Annotated Instructor's Guide: \$100 **ISBN 0-13-101078-6**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

62301-02 General Maintenance and Winterizing Pipeline Equipment (7.5 Hours)

Explains preventive and predictive maintenance and general maintenance on rotating machinery. Explains gas compressors and maintaining pumps and prime movers.

Trainee \$20.00 **ISBN 0-13-103156-2**

Instructor \$20.00 **ISBN 0-13-103166-X**

62302-02 Pipeline Damage Inspection

(CT 34 and 35) (10 Hours)

Identifies sources and types of damage, including construction, third-party, natural events, and blasting. Explains checking pipe clearance and repairing wide cracks and foam damage.

Trainee \$20.00 **ISBN 0-13-103157-0**

Instructor \$20.00 **ISBN 0-13-103167-8**



Pipeline Maintenance

62303-02 Performing In-Line Inspections (CT 29) (15 Hours)

Explains the preparation for pigging, types of pigs and associated tools, and running pigs. Includes following up on collected data, such as interpreting findings.

Trainee \$20.00 **ISBN 0-13-103158-9**
 Instructor \$20.00 **ISBN 0-13-103168-6**

62304-02 Pipeline Repair (CT 9.5, 37, 40.1, 40.2, 40.3, 40.4, 40.5, 40.7, and 40.91) (40 Hours)

Covers the proper procedures for several pipeline repairs. Includes information on installing various types of pipe sleeves, cutting and replacing sections of pipe, performing taps of two inches or smaller, and repairing shorted casings.

Trainee \$20.00 **ISBN 0-13-103159-7**
 Instructor \$20.00 **ISBN 0-13-103170-8**

62305-02 Relocating and Lowering Pipelines (CT 33 and 34) (15 Hours)

Explains preparations for moving pipelines, both in-service and out-of-service, procedures for moving pipelines, inspecting the line, and backfilling the excavation.

Trainee \$20.00 **ISBN 0-13-103160-0**
 Instructor \$20.00 **ISBN 0-13-103171-6**

62306-02 Hot Tapping and Stopping® - 2.5" and Larger (CT 40.6, 40.8, 40.9, and 40.91) (15 Hours)

Discusses hot tapping procedures, including safety issues, selection of equipment, and preparation for tapping. Gives instructions for installing tapping machines, and stopping procedures.

Trainee \$20.00 **ISBN 0-13-103161-9**
 Instructor \$20.00 **ISBN 0-13-103172-4**

62307-02 Tank Repair (40 Hours)

Explains complete tank repair, including flange tightening, nondestructive testing, electrically insulated fittings and flanges, welding, bottom repair, bottom replacement, moving, arc burn and weld repair, roof installation, shell plate replacement, aluminum and steel floating roof demolition, building a floating roof, floating roof in-service seal replacement, and nozzles, manways, and sumps.

Trainee \$20.00 **ISBN 0-13-103162-7**
 Instructor \$20.00 **ISBN 0-13-103173-2**

62308-02 Maintenance Welding on Pipelines (CT 42) (25 Hours)

Explains repairing arc burns, defective welds, direct pass defects, butt welds, and previously repaired welds. Includes weld or cylinder of pipe replacement, general welding procedures, and dealing with problems. Also discusses the requirements for inspection of maintenance welds on pipelines.

Trainee \$20.00 **ISBN 0-13-103163-5**
 Instructor \$20.00 **ISBN 0-13-103174-0**

62309-02 Performing Pipeline Disconnection Procedures (CT 36) (20 Hours)

Identifies equipment and procedures required to safely perform disconnection procedures and hazards that may be encountered. Explains performing safe disconnects, purging pipeline segments, and sealing disconnected pipeline.

Trainee \$20.00 **ISBN 0-13-103164-3**
 Instructor \$20.00 **ISBN 0-13-103175-9**

62310-02 Vault Maintenance and Confined Space Entry (CT 59) (15 Hours)

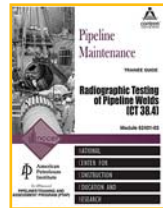
Identifies the safety requirements and the hazards of confined space entry. Explains vault inspections.

Trainee \$20.00 **ISBN 0-13-103165-1**
 Instructor \$20.00 **ISBN 0-13-103176-7**

Product Supplements

Computerized Testing Software ISBN 0-13-103328-X	\$30
Transparency Masters ISBN 0-13-103329-8	\$25

Radiographic Testing of Pipeline Welds



62401-03 Radiographic Testing of Pipeline Welds (CT 38.4) 25 Hours
 Published: 2003

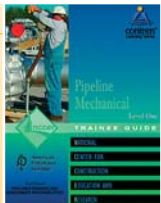
Trainee: \$20 **ISBN 0-13-106800-8**
 Instructor: \$20 **ISBN 0-13-106801-6**

Provides specific training for certified SNT-TC-1A Level II radiographic technicians who perform radiographic testing of pipeline welds in accordance with the requirements of API-1104. Recognition of specific discontinuities using copies of radiographic images is featured.

Pipeline Mechanical

L1 PIPELINE MECHANICAL

LEVEL 1



Curriculum Notes

- 197.5 Hours (includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See pg. 9 for ordering information).
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046670-0**
 Annotated Instructor's Guide: \$100 **ISBN 0-13-046681-6**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

66101-02 Introduction to the Pipeline Industry (Pipeline Core) (15 Hours)

Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee \$20.00 **ISBN 0-13-038223-X**
 Instructor \$20.00 **ISBN 0-13-038234-5**

66102-02 Liquid Pipeline General Abnormal Operating Conditions (Pipeline Core) (5 Hours)

Introduces the Abnormal Operating Conditions (AOCs) that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to AOCs and the necessary documentation and notifications that must be completed when responding to AOCs.

Trainee \$20.00 **ISBN 0-13-038224-8**
 Instructor \$20.00 **ISBN 0-13-038235-3**

63103-02 Pipeline Mechanic Hand and Power Tools (10 Hours)

Introduces various hand and power tools used to maintain and install pipeline equipment. Explains basic hand and power tool safety and procedures for selecting, inspecting, using, and maintaining the tools.

Trainee \$20.00 **ISBN 0-13-038336-8**
 Instructor \$20.00 **ISBN 0-13-038343-0**



Pipeline Mechanical

63104-02 Piping and Mechanical Blueprint Reading (15 Hours)

Explains how to read plot plans, P&IDs, piping isometric drawings, detail sheets, and machine drawings. Also explains the common components and symbols used in various types of drawings.

Trainee \$20.00 **ISBN 0-13-038337-6**
 Instructor \$20.00 **ISBN 0-13-038344-9**

63105-02 Tubing, Threaded Pipe, and Hoses (30 Hours)

Introduces a variety of tubing, tubing materials, tools, and work practices used in the pipeline industry. Identifies the various materials used in threaded piping systems and explains the types and uses of various screwed fittings.

Trainee \$20.00 **ISBN 0-13-038338-4**
 Instructor \$20.00 **ISBN 0-13-038345-7**

63106-02 Fasteners (10 Hours)

Identifies and explains installation procedures for threaded, nonthreaded, and insulation fasteners used in the pipeline industry.

Trainee \$20.00 **ISBN 0-13-038339-2**
 Instructor \$20.00 **ISBN 0-13-038346-5**

63107-02 Identify, Install, and Maintain Valves (CT 19.1 through 19.4) (15 Hours)

Identifies the various types of valves used in the pipeline industry and covers storage and handling, installation, and preventive maintenance procedures for these valves.

Trainee \$20.00 **ISBN 0-13-038330-9**
 Instructor \$20.00 **ISBN 0-13-038347-3**

63108-02 Identify Types of Valve Actuators/Operators (15 Hours)

Identifies the various types of manual, electric, hydraulic, and pneumatic valve actuators used in the pipeline industry and covers storage and handling, installation, and preventive maintenance procedures for these actuators.

Trainee \$20.00 **ISBN 0-13-038341-4**
 Instructor \$20.00 **ISBN 0-13-038348-1**

63109-02 Installing Seals and Gaskets (10 Hours)

Covers the applications, removal procedures, and installation procedures for dynamic and static seals and O-rings. Also identifies gaskets and gasket materials and explains the procedures for laying out, cutting, and installing gaskets.

Trainee \$20.00 **ISBN 0-13-038342-2**
 Instructor \$20.00 **ISBN 0-13-038340-6**

L2 PIPELINE MECHANICAL

LEVEL 2

Curriculum Notes

- 155 Hours
- Published: 2002

PAPERBACK

Trainee Guide: \$100 **ISBN 0-13-046682-4**
 Annotated Instructor's Guide: \$100 **ISBN 0-13-046683-2**

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

63201-02 Introduction to Pneumatic Systems (10 Hours)

Explains pneumatic system safety, characteristics of gases and how they are compressed, pneumatic transmission of energy, and compressor operation.

Trainee \$20.00 **ISBN 0-13-038351-1**
 Instructor \$20.00 **ISBN 0-13-038363-5**

63202-02 Introduction to Hydraulic Systems (10 Hours)

Explains hydraulic system safety and the basic principles of hydraulics, including Pascal's law and Bernoulli's principle. Explains the function of fluids, parts, pumps, and motors.

Trainee \$20.00 **ISBN 0-13-038352-X**
 Instructor \$20.00 **ISBN 0-13-038364-3**

63203-02 Specialty and Precision Tools (15 Hours)

Introduces different types of specialty tools and precision measuring tools and explains how to select, inspect, use, and care for these tools.

Trainee \$20.00 **ISBN 0-13-038353-8**
 Instructor \$20.00 **ISBN 0-13-038366-X**

63204-02 Inspect and Repair Valves (CT 20, 21.2, and 21.3) (20 Hours)

Identifies and explains the different valve inspection requirements. Describes routine walk-around inspections, external integrity inspections, functional test requirements, and the procedures to leak test a valve. Also describes how to disassemble a valve, perform internal inspection requirements, and reassemble a valve.

Trainee \$20.00 **ISBN 0-13-038354-6**
 Instructor \$20.00 **ISBN 0-13-038367-8**

63205-02 Maintain and Repair Pressure Limiting Devices and Relief Valves (CT 22, 23.1, 23.2, and 24) (20 Hours)

Identifies types of relief valves and pressure limiting devices. Explains how to inspect, test, and calibrate tank relief valves, pipeline relief valves, and pressure limiting devices.

Trainee \$20.00 **ISBN 0-13-038355-4**
 Instructor \$20.00 **ISBN 0-13-038368-6**

63206-02 Introduction to Metering Devices and Provers (10 Hours)

Identifies and explains the use of various types of pipeline meters including positive displacement, turbine, ultrasonic, mass-flow, vortex, and orifice. Identifies and explains the use of provers including tank provers, traditional pipe provers, and small volume pipe provers.

Trainee \$20.00 **ISBN 0-13-038357-0**
 Instructor \$20.00 **ISBN 0-13-038369-4**

63207-02 Introduction to Pumps (10 Hours)

Identifies and explains various types of main-line and feeder line pumps including centrifugal, rotary, reciprocating, and metering pumps. Explains net positive suction head and cavitation. Outlines general procedures for pump installation.

Trainee \$20.00 **ISBN 0-13-038358-9**
 Instructor \$20.00 **ISBN 0-13-038360-0**

63208-02 Introduction to Gas Compressors (10 Hours)

Identifies and explains the various types of gas compressors used in the transmission of gas through pipelines. Also explains the function and operation of compressors and identifies the auxiliary equipment used with compressors.

Trainee \$20.00 **ISBN 0-13-038359-7**
 Instructor \$20.00 **ISBN 0-13-038371-6**

63209-02 Install and Maintain Bearings (15 Hours)

Identifies and explains various types of friction and antifriction bearings, bearing materials, and bearing designation. Gives procedures to remove, troubleshoot, and install bearings.

Trainee \$20.00 **ISBN 0-13-038350-3**
 Instructor \$20.00 **ISBN 0-13-038373-2**

63210-02 Install Mechanical Seals (20 Hours)

Explains the function and advantages of mechanical seals. Identifies parts and types of mechanical seals. Includes procedures for removing, inspecting, and installing mechanical seals.

Trainee \$20.00 **ISBN 0-13-038361-9**
 Instructor \$20.00 **ISBN 0-13-038374-0**

Product Supplements

Computerized Testing Software ISBN 0-13-038436-4	\$30
Transparency Masters ISBN 0-13-038424-0	\$25



Pipeline Mechanical

63211-02 Maintain and Repair Drivers

(15 Hours)

Identifies types of drivers that provide power to rotating equipment on pipelines. Explains how to inspect and replace drivers, replace bearings and seals, and perform preventative maintenance.

Trainee \$20.00 **ISBN 0-13-038362-7**
 Instructor \$20.00 **ISBN 0-13-038375-9**

Product Supplements	
Computerized Testing Software ISBN 0-13-038437-2	\$30
Transparency Masters ISBN 0-13-038425-9	\$25

L3 PIPELINE MECHANICAL

LEVEL 3

Curriculum Notes

- 160 Hours
- Published: 2002

PAPERBACK	
Trainee Guide: \$100	ISBN 0-13-101079-4
Annotated Instructor's Guide: \$100	ISBN 0-13-101081-6

MODULES

All of the modules listed below are included in the Trainee and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

63301-02 Installing Rotating Equipment

(25 Hours)

Identifies the inspection requirements for an equipment pad, requirements for equipment base preparation, and procedures for inspecting equipment prior to installation. Also explains how to prepare equipment prior to installation, the installation process for rotating equipment, and the procedures used to relieve pipe stress from rotating equipment.

Trainee \$20.00 **ISBN 0-13-103178-3**
 Instructor \$20.00 **ISBN 0-13-103188-0**

63302-02 Unit Alignment (40 Hours)

Describes the types of equipment misalignment and how to identify and correct them. Explains how to perform conventional, rim and face indicator, reverse dial indicator, and laser alignments. Also identifies other laser alignment procedures that may be completed on the machinery trains depending on equipment needs.

Trainee \$20.00 **ISBN 0-13-103179-1**
 Instructor \$20.00 **ISBN 0-13-103189-9**

63303-02 Vibration Analysis (5 Hours)

Explains and identifies the most common causes of vibration and how to minimize them. Includes vibration monitoring techniques, vibration analysis techniques, vibration test equipment, and how to field balance machines.

Trainee \$20.00 **ISBN 0-13-103180-5**
 Instructor \$20.00 **ISBN 0-13-106190-9**

63304-02 Maintain, Troubleshoot, and Repair Pumps (10 Hours)

Identifies the preventive maintenance requirements, inspection requirements, and common troubleshooting techniques for pumps used in the pipeline industry. Also gives general guidelines for preparing a pump for shutdown, removing a pump from a pipeline system, disassembling a pump, installing the pump after the pump has been reassembled, and preparing the pump for startup and operational check after maintenance or repair has been completed.

Trainee \$20.00 **ISBN 0-13-103181-3**
 Instructor \$20.00 **ISBN 0-13-103191-0**

63305-02 Maintain, Troubleshoot, and Repair Gas Compressors (15 Hours)

Identifies the typical lubrication system components, preventive maintenance requirements, and common troubleshooting techniques for a gas compressor. Also gives general guidelines for preparing a gas compressor for shutdown and repair, isolating a gas compressor from a pipeline system, repairing rotary and reciprocating gas compressors, and preparing a gas compressor for startup and operational check after maintenance has been completed.

Trainee \$20.00 **ISBN 0-13-103182-1**
 Instructor \$20.00 **ISBN 0-13-103192-9**

63306-02 Maintain, Troubleshoot, and Repair Pneumatic Valve Actuators/Operators and Systems (CT 19.6 and 21.1) (15 Hours)

Explains the general procedures for performing preventive maintenance and troubleshooting pneumatic systems. Includes inspecting and repairing pneumatic system components. Also explains how to adjust and repair pneumatic valve actuators/operators and read pneumatic system schematic diagrams.

Trainee \$20.00 **ISBN 0-13-103183-X**
 Instructor \$20.00 **ISBN 0-13-103194-5**

63307-02 Maintain, Troubleshoot, and Repair Hydraulic Valve Actuators/Operators and Systems (CT 19.7 and 21.4) (15 Hours)

Explains the general procedures for performing preventive maintenance and troubleshooting hydraulic systems. Includes inspecting and repairing hydraulic system components. Also explains how to adjust and repair hydraulic valve actuators/operators and read hydraulic system schematic diagrams.

Trainee \$20.00 **ISBN 0-13-103184-8**
 Instructor \$20.00 **ISBN 0-13-103195-3**

63308-02 Maintain, Troubleshoot, and Repair Electric Valve Actuators/Operators and Systems (CT 19.5 and 21.5) (15 Hours)

Explains the general procedures for performing preventive maintenance and troubleshooting electric valve actuators/operators. Includes inspecting electric valve actuator/operator components. Also explains how to adjust and repair electric valve actuator/operators.

Trainee \$20.00 **ISBN 0-13-103186-4**
 Instructor \$20.00 **ISBN 0-13-103196-1**

63309-02 Maintain, Troubleshoot, and Repair Metering Devices and Provers (20 Hours)

Explains how to inspect, maintain, and repair metering devices and prover systems. Also describes the waterdraw calibration procedures used to calibrate and verify the reliability of prover systems.

Trainee \$20.00 **ISBN 0-13-103187-2**
 Instructor \$20.00 **ISBN 0-13-103197-X**

Product Supplements	
Computerized Testing Software ISBN 0-13-103330-1	\$30
Transparency Masters ISBN 0-13-103331-X	\$25





Field Safety

Contren® Safety Learning Series

The Contren® Safety Learning Series consists of three separate titles comprising a suggested education path: Safety Orientation, Field Safety, and Safety Technology. The Contren® curriculum was built upon industry best practices by a team of safety professionals and meets the training needs of the craft professional, safety technician, and safety manager.

The modularized structure of the curriculum allows companies to cost-effectively customize training programs and offer industry credentials through NCCER's National Registry. The Contren® curriculum has been recognized by the Council on Certification of Health, Environmental, and Safety Technologists (CCHST) as exam preparation for their Safety Trained Supervisor (STS) and Occupational Health and Safety Technologist (OHST) certifications. CCHST is a joint venture of the Board of Certified Safety Professionals and the American Board of Industrial Hygiene.

For more information on CCHST exam study materials, visit www.nccer.org.

FIELD SAFETY



Curriculum Notes

- 47.5 Hours
- Published: 2003
- Provides the necessary safety task training to all field personnel. This manual is designed for individuals involved with completing or overseeing a specific task, from the craftsperson, crew leader, safety supervisor, to superintendent.
- Also available in Spanish. Only the Trainee Guide, tests and transparency masters have been translated. The Instructor's version is the Trainee Guide shrinkwrapped with the translated tests. Ordering information below.

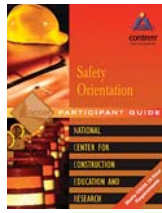
PAPERBACK (includes all five volumes)

Participant Guide: \$82 **ISBN 0-13-106256-5**
Annotated Instructor's Guide: \$82 **ISBN 0-13-106257-3**

SPANISH VERSION (Paperback)

Participant Guide: \$82 **ISBN 0-13-601805-X**
Instructor's Guide: \$82 **ISBN 0-13-601806-8**

Safety Orientation



Module 75501-04

10 Hours - Published: 1998 - Revised: 2004

Meets OSHA's requirements for a 10-hour construction industry training program.*

This 10-hour course provides employees with best practices for some of the most common and hazardous situations on the job site. Designed for all employees on the job site.

*OSHA 500 Certified Instructors may provide OSHA 10-hour cards to students who successfully complete NCCER's Safety Orientation.

PAPERBACK

Pocket Guide: \$12 **ISBN 0-13-163612-X**

Annotated Instructor's Guide: \$22 **ISBN 0-13-163613-8**

(full size; includes tests and transparency masters)

- Introduction to Safety Orientation
- Hazard Recognition, Evaluation and Control
- Construction Health
- Personal Protective Equipment
- Signs, Signals and Barricades
- Housekeeping
- Electrical Hazards
- Fire Protection and Prevention
- Hand and Power Tool Safety
- Elevated Work and Fall Protection
- Work Permit Systems
- Trenching Safety
- Materials Handling and Storage
- Emergency Response
- Specialty Work

ORIENTACIÓN DE SEGURIDAD

Safety Orientation in Spanish

Pocket Guide: \$12 **ISBN 0-13-163614-6**

Annotated Instructor's Guide: \$22 **ISBN 0-13-163615-4**

PRODUCT SUPPLEMENTS

Safety PowerPoint® Presentation Slides

(One CD includes PowerPoints® for Safety Orientation, Field Safety and Safety Technology.)

ISBN 0-13-163616-2 \$80

VOLUMES

Each volume is paperback and includes the modules listed. (Note: Modules are not available for individual sale)

V1 FIELD SAFETY

VOLUME 1

Participant Guide: \$20 **ISBN 0-13-106760-5**

Annotated Instructor's Guide: \$20 **ISBN 0-13-106765-6**

75101-03 Introduction to Safety (2.5 Hours)

This module introduces basic safety concepts and explains the difference between regulatory compliance and best practices. It introduces the participant to OSHA and describes how accidents and their associated costs affect everyone on the job site.

75102-03 Hazard Communication (2.5 Hours)

HazCom is an important part of working safely on any job site. In this module, participants learn appropriate on-site safety and emergency-response procedures. As well, they learn the purpose of MSDSs and warning labels, and how to read, interpret, and use them.

75103-03 Personal Protective Equipment (2.5 Hours)

Participants learn the basics of selecting, using, and maintaining basic personal protective equipment, including safety goggles, gloves, harnesses, hard hats, and hearing protection. Participants also learn about the three main types of respiratory equipment used in construction.

75104-03 Work-Zone Safety (2.5 Hours)

Participants are introduced to the signs, signals, color codes, tags, and barricades commonly found on the job site. They also learn how to use these items to recognize and avoid job-site hazards.

Field Safety

V5 FIELD SAFETY

VOLUME 5

Participant Guide: \$20	ISBN 0-13-106764-8
Annotated Instructor's Guide: \$20	ISBN 0-13-106770-2

75117-03 Lockout/Tagout (2.5 Hours)

Participants learn to properly use lockout/tagout procedures. They also learn to recognize, avoid, and prevent typical safety hazards and utilize appropriate safeguards related to lockout/tagout procedures.

75118-03 Confined Spaces (2.5 Hours)

Introduces participants to the hazards and safeguards associated with confined-space work. Participants learn the proper on-site safety and emergency-response procedures, and the difference between permit-required and non-permit-required confined spaces.

75119-03 Concrete and Masonry (2.5 Hours)

Concrete and masonry work involves several specific safety hazards. Participants learn to identify, avoid, and respond to these dangers. This module also covers on-site safety procedures and personal protective equipment use.

Product Supplements

Computerized Testing Software ISBN 0-13-106794-X	\$30
Safety PowerPoint® Presentation Slides <i>(One CD includes PowerPoints® for Safety Orientation, Field Safety and Safety Technology)</i> ISBN 0-13-163616-2	\$80
Transparency Masters ISBN 0-13-106797-4	\$25
Transparency Masters in Spanish ISBN 0-13-602036-4	\$25

V2 FIELD SAFETY

VOLUME 2

Participant Guide: \$20	ISBN 0-13-106761-3
Annotated Instructor's Guide: \$20	ISBN 0-13-106766-4

75105-03 Electrical and High-Voltage Hazards (2.5 Hours)

This module introduces participants to lockout/tagout procedures, the risks associated with working around electricity and high voltage, and the effects of electrical shock on the human body. Participants learn to recognize and avoid electrical and high-voltage hazards.

75106-03 Fire Protection and Prevention (2.5 Hours)

This module gives participants the fundamentals of fire protection, prevention, and safety. Participants learn how to avoid fires on the job site and how to appropriately respond when fires do occur. Also addressed are the various types of fires and the specific class of extinguishers used for each.

75107-03 Hand- and Power-Tool Safety (2.5 Hours)

Safe hand- and power-tool use is key to avoiding many preventable accidents. Participants learn to recognize and respond to the various hazards posed by tools and power sources. As well, participants learn to properly use and maintain various types of tools.

75108-03 Welding Safety (2.5 Hours)

Covers the hazards and precautions associated with welding and metal cutting operations, as well as handling and storing compressed gases. Participants learn to use appropriate personal protective equipment and to recognize and prevent unsafe conditions related to welding operations.

V3 FIELD SAFETY

VOLUME 3

Participant Guide: \$20	ISBN 0-13-106762-1
Annotated Instructor's Guide: \$20	ISBN 0-13-106768-0

75109-03 Fall Protection (2.5 Hours)

In this module, participants learn to identify, avoid, and react to unsafe conditions associated with working at elevations. Also covered are the proper selection and use of fall-protection equipment.

75110-03 Steel Erection (2.5 Hours)

The steel-erection process and its related safety hazards are covered in this module. Participants learn to use appropriate personal protective equipment and to recognize, avoid, and prevent hazardous conditions associated with steel-erection jobs.

75111-03 Walking and Working Surfaces (2.5 Hours)

Participants learn how to recognize the hazards, employ the safeguards, and avoid and respond to accidents and injuries related to walking and working surfaces.

75112-03 Ladders and Scaffolding (2.5 Hours)

While ladders and scaffolding are common objects on a construction site, they are also a common cause of injuries and accidents. In this module, participants learn to identify, safely set up, and properly use various types of ladders and scaffolding.

V4 FIELD SAFETY

VOLUME 4

Participant Guide: \$20	ISBN 0-13-106763-X
Annotated Instructor's Guide: \$20	ISBN 0-13-106769-9

75113-03 Horizontal Directional Drilling Hazards (2.5 Hours)

Introduces participants to the hazards related to performing and working near horizontal directional drilling operations. Participants also learn related on-site safety and emergency-response procedures.

75114-03 Heavy-Equipment, Crane, and Rigging Safety (2.5 Hours)

Heavy-equipment is used on a variety of work sites and exposes workers to substantial hazards. Participants are introduced to the types and uses of heavy equipment as well as the hazards, safeguards, and procedures relevant to heavy-equipment, crane, and rigging work.

75115-03 Trenching Safety (2.5 Hours)

Trenching and excavation work exposes workers to a variety of hazards. Participants learn on-site safety and emergency-response procedures related to this work. Participants also learn to recognize unsafe conditions; the signs and causes of unstable trenches; procedures used in shoring, sloping, and shielding safety methods; and how to differentiate between soil types as they relate to excavation work.

75116-03 Forklift Safety (2.5 Hours)

Participants learn safe forklift traveling, load handling, and operation procedures. They also learn to properly perform pre-shift inspections and to work safely in areas where forklifts are in use.



Safety Technology

SAFETY TECHNOLOGY



Curriculum Notes

- 45 Hours
- Published: 2003
- Provides instruction on how to implement and administer a company safety program. This manual is designed for field managers, safety directors, safety committees, owner safety representatives, and insurance/loss control representatives.

PAPERBACK (includes all five volumes)

Participant Guide: \$82 **ISBN 0-13-106258-1**
 Annotated
 Instructor's Guide: \$82 **ISBN 0-13-106259-X**

VOLUMES

Each volume is paperback and includes the modules listed. (Note: Modules are not available for individual sale)

V1 SAFETY TECHNOLOGY

VOLUME 1

Participant Guide: \$20 **ISBN 0-13-106771-0**
 Annotated
 Instructor's Guide: \$20 **ISBN 0-13-106777-X**

75201-03 Introduction to Safety Technology (2.5 Hours)

Participants learn the roles and responsibilities of the safety technician. Also discussed are the three levels of accident causation, accident cost impact, safety program components, and government regulatory requirement impact on the construction industry.

75202-03 Hazard Recognition, Evaluation, and Control (2.5 Hours)

Participants are taught the techniques used to recognize hazards, unsafe acts, and unsafe conditions on the job site. They also learn to evaluate acceptable job-site risk levels and are introduced to the seven major methods of hazard control.

75203-03 Risk Analysis and Assessment (2.5 Hours)

Focuses on the relationship between human behavior and work-site safety. Participants learn the factors involved in performance analysis and the techniques used to coach and counsel workers with performance problems.

75204-03 Inspections, Audits, and Observations (2.5 Hours)

Introduces participants to the roles and responsibilities of the safety technician with regard to on-site inspections, audits, and observations. Participants learn the purpose of safety inspections and learn to properly conduct safety audits and employee observations.

V2 SAFETY TECHNOLOGY

VOLUME 2

Participant Guide: \$20 **ISBN 0-13-106772-9**
 Annotated
 Instructor's Guide: \$20 **ISBN 0-13-106778-8**

75205-03 Employee Motivation (2.5 Hours)

Stresses the importance of effectively communicating safety policies and procedures to all employees on the job site. Participants learn to provide employee recognition, discipline, and motivation.

75206-03 Site-Specific ES&H Plans (2.5 Hours)

Environmental Safety and Health (ES&H) plans must be modified to meet job-specific conditions. In this module, participants learn to make these modifications, coordinate implementation of ES&H plans, identify job-specific hazards and requirements using pre-bid checklists, and evaluate hazard risks.

75207-03 Emergency Action Plans (2.5 Hours)

This module focuses on the basics of emergency action plans and media communications.

75208-03 JSAs and TSAs (2.5 Hours)

Covers the purposes of and differences between job safety analyses and task safety analyses. Participants learn to properly conduct safety analyses.

V3 SAFETY TECHNOLOGY

VOLUME 3

Participant Guide: \$20 **ISBN 0-13-106773-7**
 Annotated
 Instructor's Guide: \$20 **ISBN 0-13-106779-6**

75209-03 Safety Orientation and Training (2.5 Hours)

The basics of safety training program coordination are covered in this module. Participants learn to effectively implement safety training.

75210-03 Work Permit Policies (2.5 Hours)

Focuses on the roles and responsibilities of the safety technician with regard to work permit policies. Participants learn about safety technicians' permit-related roles in hot work, confined-space work, excavation work, electrical hot work, and lockout/tagout procedures.

75211-03 Confined-Space Entry Procedures (2.5 Hours)

Stressing the safety requirements of confined-space work, this module covers related permit, entry, emergency, and rescue procedures. Participants also learn the main types of atmospheric hazards and the procedures used for testing for them in confined spaces.

75212-03 Safety Meetings (2.5 Hours)

Participants learn to effectively communicate safety issues and concerns to workers through safety meetings. Also covered are methods for using safety meetings to implement corrective actions to unsafe practices and behavior.

V4 SAFETY TECHNOLOGY

VOLUME 4

Participant Guide: \$20 **ISBN 0-13-106774-5**
 Annotated
 Instructor's Guide: \$20 **ISBN 0-13-106780-X**

75213-03 Accident Investigation: Policies and Procedures (2.5 Hours)

Participants learn the connection between accident investigation and accident prevention in this module. Also covered are the purposes and uses of accident investigations. Participants learn to properly conduct accident investigation interviews and fill out related forms.

75214-03 Accident Investigation: Data Analysis (2.5 Hours)

Expands on the concept of accident investigation as a preventative tool. Participants study and practice the methods commonly used for performing accident investigation data analysis in this module.

75215-03 Recordkeeping (2.5 Hours)

Accurate recordkeeping is essential for OSHA compliance. Participants learn to follow OSHA recordkeeping requirements, and to properly document work-related illnesses and injuries using the appropriate OSHA forms.

V5 SAFETY TECHNOLOGY

VOLUME 5

Participant Guide: \$20 **ISBN 0-13-106776-1**
 Annotated
 Instructor's Guide: \$20 **ISBN 0-13-106781-8**

75216-03 OSHA Inspection Procedures (2.5 Hours)

Focusing on the safety technician's role during OSHA inspections, this module covers the process and purpose of OSHA site inspections. Participants learn the difference between focused and wall-to-wall inspections, the appropriate follow-up actions resulting from an inspection, and the consequences of OSHA citations, violations, and fines.



Safety Technology

75217-03 ES&H Data Tracking and Trending (2.5 Hours)

Participants learn the traditional and proactive methods of measuring safety performance. They learn to analyze data to identify safety program strengths and isolate areas needing improvement.

75218-03 Environmental Awareness (2.5 Hours)

Minimizing hazardous-waste production and preventing water and soil contamination are covered in this module. Participants learn about the training and medical surveillance requirements for personnel working with materials such as hazardous waste, lead, asbestos, and silica. Also covered are the primary types of environmental problems and the hazardous-waste shipping requirements common on a construction site.

Product Supplements	
Computerized Testing Software ISBN 0-13-106795-8	\$30
Safety PowerPoint® Presentation Slides <i>(One CD includes PowerPoints® for Safety Orientation, Field Safety and Safety Technology)</i> ISBN 0-13-163616-2	\$80
Transparency Masters ISBN 0-13-106798-2	\$25



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Management

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INTRODUCTORY SKILLS FOR THE CREW LEADER

MT101



Curriculum Notes

- 16 Hours
- Published: 2003
- This course teaches the basic leadership skills required to supervise personnel. It discusses principles of project planning, scheduling, estimating, management, and presents several case studies for student participation.
- An online companion is available with this title. Contact NCCER's Customer Service Department for more information.

PAPERBACK

Participant Guide: \$40 **ISBN 0-13-103593-2**
 Annotated
 Instructor's Guide: \$60 **ISBN 0-13-103594-0**
(includes transparency masters)

PROJECT SUPERVISION



Curriculum Notes

- 85 Hours
- Published: 2001

PAPERBACK

Participant Guide: \$95 **ISBN 0-13-103595-9**
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 Instructor's Guide: \$110 **ISBN 0-13-103596-7**
(includes transparency masters)

MODULES

All of the modules listed below are included in the Participant and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

MT201-01 Orientation to the Job (5 Hours)

Introduces the trainee to the history of the construction industry and to organization theory. Covers the phases of a construction project and the role and duties of the supervisor.

Participant \$18.00 **ISBN 0-13-103666-1**
 Instructor \$18.00 **ISBN 0-13-103675-0**

MT202-01 Human Relations and Problem Solving (20 Hours)

Focuses on the communication process and developing effective communication and leadership skills. Compares problem solving to decision making. Discusses potential human relations difficulties and how to resolve them.

Participant \$18.00 **ISBN 0-13-103667-X**
 Instructor \$18.00 **ISBN 0-13-103676-9**

MT203-01 Safety (7.5 Hours)

Covers the supervisor's role in job site safety, the true cost of accidents, and how to train and involve all employees in job safety. Includes OSHA safety inspections.

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MT204-01 Quality Control (5 Hours)

Defines quality control and the types of quality control. Explains how to incorporate quality and safety through effective communication, document control, and inspections.

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 Instructor \$18.00 **ISBN 0-13-103678-5**

MT205-01 Contract and Construction Documents (5 Hours)

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 Instructor \$18.00 **ISBN 0-13-103679-3**

MT206-01 Document Control and Estimating (10 Hours)

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 Instructor \$18.00 **ISBN 0-13-103681-5**

MT207-01 Planning and Scheduling (17.5 Hours)

Introduces the stages of planning, how to implement a plan, and how to coordinate with other contractors. Includes planning resources, materials, equipment, tools, and labor. Discusses short- and long-term schedules.

Participant \$18.00 **ISBN 0-13-103673-4**
 Instructor \$18.00 **ISBN 0-13-103682-3**

MT208-01 Resource Control and Cost Awareness (15 Hours)

Teaches the trainee how to measure job site productivity and how to increase it. Discusses resource, material, tool, equipment, labor, quality, and cost and resource control. Introduces cost awareness and types of reports.

Participant \$18.00 **ISBN 0-13-103674-2**
 Instructor \$18.00 **ISBN 0-13-103683-1**

L1 PROJECT MANAGEMENT



Curriculum Notes

- 115 Hours
- Published: 1997 Revised: 2008, Second Edition
- A companion DVD with scenarios is under development for this title. Contact NCCER's Product Development Department for more information.

PAPERBACK

Participant Guide: \$95 **ISBN 0-13-604486-7**
 Annotated
 Instructor's Guide: \$95 **ISBN 0-13-604487-5**

MODULES

All of the modules listed below are included in the Participant and Annotated Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

44101-08 Introduction to Project Management (2.5 Hours)

Introduces the role and responsibilities of project management, including technical and management skills and an overview of the phases in a construction project. Describes alternate project delivery methods.

Participant \$18.00 **ISBN 0-13-603843-3**
 Instructor \$18.00 **ISBN 0-13-603821-2**

Management

44102-08 Safety (15 Hours)

Stresses the importance of job site safety and identifies the project manager's duties and responsibilities regarding safety. Covers loss prevention and creating a zero-accident work environment. Presents several checklists as references.

Participant \$18.00 **ISBN 0-13-603844-1**
 Instructor \$18.00 **ISBN 0-13-603822-0**

NEW! 44103-08 Interpersonal Skills

(12.5 Hours)

Discusses the values and expectations of the workforce, building relationships, and satisfying stakeholders. Describes the principles of effective communication, applying the management grid, and using relationship skills to create a leadership environment. Also discusses behavioral interviewing and professional development of personnel.

Participant \$18.00 **ISBN 0-13-603845-X**
 Instructor \$18.00 **ISBN 0-13-603823-9**

NEW! 44104-08 Issues and Resolutions

(15 Hours)

Describes the key elements of successful negotiations and negotiating techniques. Discusses how to recognize nonverbal signals, use negotiating tools, and apply conflict resolution strategies. Identifies symptoms and barriers to solving project-related problems and applying problem-solving techniques, brainstorming, and identifying root cause consequences.

Participant \$18.00 **ISBN 0-13-603847-6**
 Instructor \$18.00 **ISBN 0-13-603859-X**

44105-08 Construction Documents (10 Hours)

Emphasizes the importance of documentation and explains the types of documents, drawings, and specifications used on a project. Explains methods of obtaining work in the industry and types of contracts and insurance requirements. Describes the change order process and the documents required to close out a project.

Participant \$18.00 **ISBN 0-13-603848-4**
 Instructor \$18.00 **ISBN 0-13-603861-1**

44106-08 Construction Planning (10 Hours)

Discusses the importance of formal job planning and creating a performance-based work environment. Discusses the Work Breakdown Structure (WBS) as the foundation that identifies deliverables, tasks, and time. Introduces the basics of quality control and defines the roles and responsibilities of an effective team and how to allocate resources.

Participant \$18.00 **ISBN 0-13-603849-2**
 Instructor \$18.00 **ISBN 0-13-603862-X**

44107-08 Estimating and Cost Control

(15 Hours)

Emphasizes the importance of accurate estimating and summarizes the estimating process and the steps in developing an estimate. Defines the purpose of a cost control methodology, explains how to perform simple cost analysis, and covers the project manager's role in controlling cost and tracking rework cost.

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44108-08 Scheduling (15 Hours)

Provides instruction in the basics of scheduling from simple to-do lists through bar charts, network diagrams, and methods of managing resources. Discusses the importance of formal schedules, job planning, and establishing priorities. Describes alternative scheduling methods.

Participant \$18.00 **ISBN 0-13-603816-6**
 Instructor \$18.00 **ISBN 0-13-603864-6**

44109-08 Resource Control (10 Hours)

Identifies the resources that must be controlled, the major factors which affect production control, and production control standards. Explains the project manager's role in the process and how to distinguish between production and productivity. Explains how to evaluate and improve production control and productivity.

Participant \$18.00 **ISBN 0-13-603817-4**
 Instructor \$18.00 **ISBN 0-13-603865-4**

44110-08 Quality Control (5 Hours)

Defines quality control and quality assurance, and stresses management's concerns about quality. Explains project quality management and how to develop an effective quality control plan. Discusses how to identify, assess, and measure weaknesses to avoid rework.

Participant \$18.00 **ISBN 0-13-603818-2**
 Instructor \$18.00 **ISBN 0-13-603866-2**

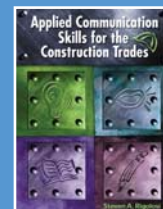
NEW! 44111-08 Continuous Improvement

(5 Hours)

Describes the project manager's role in creating a culture of continuous improvement. Explains the fundamentals of a continuous improvement program and how to identify the critical problems and processes that require improvement, implement a continuous improvement process, and measure results. Emphasizes the importance of satisfying internal and external stakeholders.

Participant \$18.00 **ISBN 0-13-603819-0**
 Instructor \$18.00 **ISBN 0-13-603867-0**

Applied Communication Skills for the Construction Trades



By Steven Rigolosi
 Published: 2002, 384 pp.
ISBN: 0-13-093355-4
 Price: \$40.20

Unlike other communication texts, which are often written for the general public or for people who work in an office atmosphere, this book has been prepared specifically to meet the needs of the construction industry. All examples are drawn from construction-related documents (such as OSHA regulations, training manuals, materials lists, job specs, and blueprints) and construction-related settings and situations. Additionally, because the book is designed to provide practice in the skills being learned, the author includes more than 100 activities in a variety of formats: self-assessments, action plans, questionnaires, and quizzes.

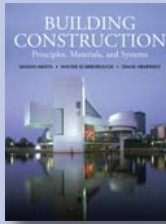
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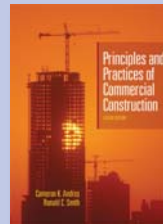
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