If you teach in industry, government, proprietary school, corrections, workforce development, community college, or university

contact your Pearson Executive Director listed below.

Bill Underwood
AL, AR, IA, KS, LA, MN, MO, MS, ND, NE, SD, TN
1-800-720-3870 ext. 3
william.underwood@pearson.com

Karen Keith
AK, AZ, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY
1-800-720-3870 ext. 4
karen.Keith@pearson.com

Susan Muggeo
CT, DE, IN, KY, MA, ME, NH, NJ, OH, PA, RI, VT, WV
1-800-720-3870 ext. 1
susan.muggeo@pearson.com

If you teach in a secondary institution

contact the Pearson Career & Technical Education team at 866-326-4259 or via phone or email address listed below.

Chris Harthan
NY (outstate), PA, ME, VT, NH, RI, CT, MA
1-952-905-7014
Chris.Harthan@pearson.com

Jenny Holland
IN, IL, GA
1-317-503-5466
Jenny.Holland@pearson.com

Debbie Romashko
DE, DC, MD, VA, AL, TN
1-952-905-7022
Debbie.Romashko@pearson.com

Holly Nicholls
WA, OR, AK, ID, MT, WY, UT, OK
1-952-905-7016
Holly.Nicholls@pearson.com

Liz Stein
WI, MI, MN, SD, ND, OH, KY, WV
1-952-905-7015
Liz.Stein@pearson.com

Bart Zwiers
IA, KS, MO, NE, AR, LA, MS
1-952-905-7017
Bart.Zwiers@pearson.com

Karen Totten
TX, NM
1-952-905-7018
Karen.Totten@pearson.com

Charlie Eisenberger
NYC, Long Island, NJ
1-732-257-4125
Charlie.Eisenberger@pearson.com

Sandy Salazar
SC, FL
1-952-905-7009
Sandy.Salazar@pearson.com

Ashley Oxborough
CA, HI, AZ, NV
1-952-905-7212
Ashley.Oxborough@pearson.com

4 EASY WAYS TO ORDER!

1. Online using OASIS
   24 hours, 7 days a week
   Pearson’s Order and Shipment Information System (OASIS) will allow you to place orders, track shipments, and view your account online.
   http://oasis.pearson.com
   • Place Orders and receive same-day shipping on all orders placed before 2:00 pm CST
   • Track orders; OASIS lists 2-3 business days
   • Check prices and availability and view product information
   • Receive order & shipment confirmation on email
   • Manage your account: view your purchase history, credit memo and invoices.
   • View account & customer reports for other offices, unshipped orders, new editions, backorders, tracking numbers and more
   • Copy and paste up to 500 lines at one time from your spreadsheet or document into OASIS
   • Use a credit card or a purchase order
   • Place orders for classrooms, shop, or for the curriculum
   • Build your own multiple shipping codes for ordering flexibility

For more information or assistance, call 800-445-9500 or visit oasis.pearson.com
For OASIS Technical Support, call 888-224-9500 or email oasis.techsupport@pearson.com.

2. Phone
   Toll-free 800-922-0579
   3. Fax
   800-445-6991

4. Mail
   Send Purchase Orders to:
   Pearson Higher Education Order Department
   P.O. Box 3039
   Lebanon, IN 46052

High School/ Secondary Institutions
Send Purchase Orders to:
   Pearson Curriculum Division
   PO Box 2300
   Los Angeles, CA 90089-0230
   Phone: 800-848-9500 or fax: 877-260-2530
   Please note: Remember to check mark “CONFIRMATION” on any copy of a phone or faxed order

How Individuals May Order
Order from individuals and schools but must be prepaid by check or credit card. A purchase order (PO) is required for institutional accounts. Check remittance only. Individual pricing is for list price, not reflected in the catalog.

Individual Ordering Department: 606-907-7700
Check out the “online catalog” at nccer.org.

Medicine Orders
Individual modules are printed on demand. Please allow 2 to 3 weeks for fulfillment and delivery. Modules are not returnable.

Pricing
All prices listed in the catalog reflect not pricing available to schools, government, business and industry accounts. Additional documents are available. Prices are subject to change without notice.

Shipping and Postage
Shipment costs are based on a factor including weight, destination and type of service. All orders are subject to equipment if shipped within the original invoice date (12 months in saleable condition) returned within 15 months of the original invoice date (12 months for high school accounts). All packages must be returned complete as sold. Individual modules are printed on demand. Modules are not returnable. There is no restocking fee for returning eligible materials to Pearson. Returns Address: Pearson Education Returns Facility, 258 Prospect Plains Rd. Cranbury, NJ 08512

High School/ Secondary Institutions
Check your order below to see if your school meets the conditions. Shipment or returned books carries the refund for credit. Before returning books, please call 800-948-9500 for return instructions. Please be prepared to supply the dates of purchase and the invoice number. Full credit is given for unshipped books (in saleable condition) returned within 15 months of the original invoice date.

Damaged Materials Policy
If you receive incorrect or damaged materials, please call Pearson Customer Service at 800-722-4579 (High School) or 1-800-445-9500 (Technical and Trade) to make arrangements for return, replacement and/or credit. Customer Service also handles questions on credit, money, refunds.

Payment Terms
Net 30 days

Billing
Invoices are generated only after items have shipped. You receive multiple invoices on any one purchase order if items are backordered or not yet shipped. Deep shipping to other carriers are accomplished by the carrier. This is not an invoice and should not be paid. Only the “Bill to” account will be invoiced.
NEW for 2014

2014 will once again be an exceptional year for new and revised products! Examples include new titles in Maritime and revisions in Carpentry, Electrical, and Masonry. We will continue to offer new online courses for NCCERconnect throughout 2014; see page 7 for more information.

- **Carpentry Levels 3 & 4**
  - p. 15–16

- **Electrical Levels 1–4**
  - p. 20–23

- **Heavy Equipment Operations Level 3**
  - p. 27

- **Instrumentation Level 1**
  - p. 37

- **Masonry Level 2**
  - p. 44

- **Plumbing Level 3 & 4**
  - p. 55–56

- **Scaffolding**
  - p. 58

- **Sprinkler Fitting Code Update Levels 1–4**
  - p. 62–63

- **Your Role in the Green Environment, LEED 4**
  - p. 68

- **Structural Fitter Levels 1 & 2**
  - p. 75–76

- **Pipeline Abnormal Operating Conditions**
  - p. 77

- **Pipeline Maintenance Levels 1 & 2**
  - p. 82–83

To Order Call: 1-800-922-0579

www.nccer.org/bookstore
Letter from the Chair of the Board

Some 37+ years ago, I began my career as a craft worker. I attribute any professional success I’ve achieved to the extensive training and experience I received in those early days. Back then I didn’t fully appreciate how much opportunity the construction and maintenance industry offers to those with an appetite for learning and the ambition to grow with that knowledge.

That was a period of great expansion of capital projects, with the nation looking for alternative energy sources such as nuclear and coal liquefaction, in addition to a robust expansion in other industries.

Now, decades later, we find ourselves in a similar situation, with the new unconventional production of gas and oil from the shale formations yielding the promise of competitive energy and feed stocks, driving a capital project expansion which many predict will easily dwarf the era that I began in. The challenge will be to meet the overwhelming demands based on the workforce numbers projected, and to ensure that each person comes adequately prepared to work safely and productively.

NCCER is working hard to break through the challenges facing the industry. NCCER’s training and assessment tools are the benchmark for the industry and allow students to earn industry-recognized, portable credentials that benefit them as they seek employment and build their careers. In addition, employers can verify the qualifications of potential employees, track the skills and development of their current workforce and provide upgrade training in specific areas of need.

This year’s catalog includes revisions to programs such as Carpentry, HVAC, and Masonry, as well as revisions to Pipeline Maintenance, Instrumentation, and Scaffold Building. Look for the 2014 NEC® update to Electrical in the summer, and for more new titles supporting the Maritime industry in the fall. NCCER is continuing to release new innovative instructor resources to include comprehensive lesson plans and robust PowerPoints®. With publishing partner Pearson, NCCER extends NCCERconnect to include Heavy Equipment Operations and Welding. New titles are also being released in customizable eBook format through the NCCER/Pearson Custom Library.

As industry leaders, we must take advantage of the opportunity presented by the increasingly robust market to attract more professionals into the crafts. One way to advance that mission is to provide industry-based standardized training and credentialing for this new workforce and the resources to upgrade the skills of our current craft professionals. I’m thrilled to be serving as Chair of the Board for an organization that I believe has the complete toolbox to address these historic challenges and opportunities. Thank you for your commitment to supporting the workforce development programs that will shape our industry’s future.

Lowell Wiles
Group Vice President, Global Construction at Jacobs Field Services
2014 NCCER Chair of the Board
<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABOUT NCCER</td>
<td>1-9</td>
</tr>
<tr>
<td>New Products for 2014</td>
<td>1</td>
</tr>
<tr>
<td>Letter from the Chair of the Board</td>
<td>2</td>
</tr>
<tr>
<td>The NCCER Program</td>
<td>4</td>
</tr>
<tr>
<td>Assessments and Certification</td>
<td>5</td>
</tr>
<tr>
<td>Pearson Custom Library</td>
<td>6</td>
</tr>
<tr>
<td>NCCERconnect</td>
<td>7</td>
</tr>
<tr>
<td>Instructor Resource Center and Online Bookstore</td>
<td>8</td>
</tr>
<tr>
<td>NCCER Module Numbers/Product Design and Supplements</td>
<td>9</td>
</tr>
<tr>
<td>CONSTRUCTION &amp; MAINTENANCE</td>
<td>10-91</td>
</tr>
<tr>
<td>Core Curriculum</td>
<td>10</td>
</tr>
<tr>
<td>- Applied Construction Math</td>
<td>11</td>
</tr>
<tr>
<td>- Careers in Construction</td>
<td>11</td>
</tr>
<tr>
<td>- Safety Orientation</td>
<td>11</td>
</tr>
<tr>
<td>- Tools for Success</td>
<td>11</td>
</tr>
<tr>
<td>- Your Role in the Green Environment</td>
<td>11</td>
</tr>
<tr>
<td>Boilermaking</td>
<td>12</td>
</tr>
<tr>
<td>Carpentry</td>
<td>14</td>
</tr>
<tr>
<td>- From the Ground Up</td>
<td>16</td>
</tr>
<tr>
<td>- Cabinetmaking</td>
<td>16</td>
</tr>
<tr>
<td>Concrete Finishing</td>
<td>17</td>
</tr>
<tr>
<td>Construction Craft Laborer</td>
<td>18</td>
</tr>
<tr>
<td>Construction Technology</td>
<td>19</td>
</tr>
<tr>
<td>Drywall</td>
<td>19</td>
</tr>
<tr>
<td>Electrical</td>
<td>20</td>
</tr>
<tr>
<td>- Managing Electrical Hazards</td>
<td>23</td>
</tr>
<tr>
<td>Electronic Systems Technician</td>
<td>23</td>
</tr>
<tr>
<td>Heavy Equipment Operations</td>
<td>26</td>
</tr>
<tr>
<td>Highway/Heavy Construction</td>
<td>28</td>
</tr>
<tr>
<td>- Hydroblasting</td>
<td>28</td>
</tr>
<tr>
<td>HVAC</td>
<td>28</td>
</tr>
<tr>
<td>- Green Topics in HVAC</td>
<td>31</td>
</tr>
<tr>
<td>Industrial Coating and Lining Application Specialist</td>
<td>31</td>
</tr>
<tr>
<td>Industrial Maintenance Electrical &amp; Instrumentation</td>
<td>32</td>
</tr>
<tr>
<td>Industrial Maintenance Mechanic</td>
<td>35</td>
</tr>
<tr>
<td>Instrumentation</td>
<td>37</td>
</tr>
<tr>
<td>Insulating</td>
<td>40</td>
</tr>
<tr>
<td>Ironworking</td>
<td>41</td>
</tr>
<tr>
<td>Masonry</td>
<td>43</td>
</tr>
<tr>
<td>Millwright</td>
<td>45</td>
</tr>
<tr>
<td>Mobile Crane Operations</td>
<td>47</td>
</tr>
<tr>
<td>Painting</td>
<td>48</td>
</tr>
<tr>
<td>Pipefitting</td>
<td>51</td>
</tr>
<tr>
<td>Pipelayer</td>
<td>53</td>
</tr>
<tr>
<td>Plumbing</td>
<td>53</td>
</tr>
<tr>
<td>Reinforcing Ironwork</td>
<td>56</td>
</tr>
<tr>
<td>Rigger/Signal Person</td>
<td>57</td>
</tr>
<tr>
<td>Scaffolding</td>
<td>58</td>
</tr>
<tr>
<td>Sheet Metal</td>
<td>59</td>
</tr>
<tr>
<td>Site Layout</td>
<td>61</td>
</tr>
<tr>
<td>Sprinkler Fitting</td>
<td>62</td>
</tr>
<tr>
<td>Tower Crane Operator</td>
<td>63</td>
</tr>
<tr>
<td>Welding</td>
<td>64</td>
</tr>
<tr>
<td>GREEN/SUSTAINABLE</td>
<td>67-91</td>
</tr>
<tr>
<td>Alternative Energy</td>
<td>67</td>
</tr>
<tr>
<td>Solar Photovoltaics</td>
<td>67</td>
</tr>
<tr>
<td>Sustainable Construction</td>
<td>68</td>
</tr>
<tr>
<td>- Sustainable Construction Supervisor</td>
<td>68</td>
</tr>
<tr>
<td>- Your Role in the Green Environment</td>
<td>68</td>
</tr>
<tr>
<td>Weatherization</td>
<td>68</td>
</tr>
<tr>
<td>Wind Energy</td>
<td>71</td>
</tr>
<tr>
<td>MANAGEMENT</td>
<td>72-76</td>
</tr>
<tr>
<td>Fundamentals of Crew Leadership</td>
<td>72</td>
</tr>
<tr>
<td>Project Supervision</td>
<td>72</td>
</tr>
<tr>
<td>Project Management</td>
<td>73</td>
</tr>
<tr>
<td>- Project Management DVD</td>
<td>73</td>
</tr>
<tr>
<td>MARITIME</td>
<td>74-75</td>
</tr>
<tr>
<td>Maritime Industry Fundamentals</td>
<td>74</td>
</tr>
<tr>
<td>Maritime Pipefitting</td>
<td>74</td>
</tr>
<tr>
<td>Structural Fitter</td>
<td>75</td>
</tr>
<tr>
<td>PIPELINE</td>
<td>76-84</td>
</tr>
<tr>
<td>Pipeline Covered Task Web-Based Training</td>
<td>77</td>
</tr>
<tr>
<td>Pipeline AOC</td>
<td>77</td>
</tr>
<tr>
<td>Gas Pipeline Operations</td>
<td>78</td>
</tr>
<tr>
<td>Liquid Pipeline Field Operations</td>
<td>78</td>
</tr>
<tr>
<td>Liquid Pipeline Control Center Operations</td>
<td>79</td>
</tr>
<tr>
<td>Pipeline Corrosion Control</td>
<td>79</td>
</tr>
<tr>
<td>Pipeline Electrical &amp; Instrumentation</td>
<td>81</td>
</tr>
<tr>
<td>Pipeline Maintenance</td>
<td>82</td>
</tr>
<tr>
<td>Pipeline Mechanical</td>
<td>84</td>
</tr>
<tr>
<td>POWER</td>
<td>86-92</td>
</tr>
<tr>
<td>Power Industry Fundamentals</td>
<td>86</td>
</tr>
<tr>
<td>Power Generation Maintenance Electrician</td>
<td>86</td>
</tr>
<tr>
<td>Power Generation I&amp;C Maintenance Technician</td>
<td>88</td>
</tr>
<tr>
<td>Power Generation Maintenance Mechanic</td>
<td>91</td>
</tr>
<tr>
<td>Power Line Worker</td>
<td>93</td>
</tr>
<tr>
<td>Power Line Worker: Distribution</td>
<td>93</td>
</tr>
<tr>
<td>Power Line Worker: Substation</td>
<td>94</td>
</tr>
<tr>
<td>Power Line Worker: Transmission</td>
<td>95</td>
</tr>
<tr>
<td>SAFETY</td>
<td>96-98</td>
</tr>
<tr>
<td>Field Safety</td>
<td>97</td>
</tr>
<tr>
<td>Safety Orientation</td>
<td>97</td>
</tr>
<tr>
<td>Safety Technology</td>
<td>98</td>
</tr>
<tr>
<td>ORDERING AND CUSTOMER SERVICE</td>
<td>inside back cover</td>
</tr>
<tr>
<td>Ordering and Customer Service</td>
<td>inside back cover</td>
</tr>
</tbody>
</table>
The NCCER Program

INDUSTRY STANDARD

NCCER sets the standard for developing craft professionals. NCCER is a not-for-profit education foundation created in 1996 as The National Center for Construction Education and Research. It was developed with the support of more than 125 construction CEOs and various association and academic leaders who united to revolutionize training for the construction industry. NCCER has developed a consistent program of accreditation, instructor certification, standardized curriculum, registry, assessment and certification, which is a key element in developing a skilled workforce of craft professionals.

PROGRAM ACCREDITATION

NCCER is the accrediting body for the industry and 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 ensures that students receive quality training based on uniform standards and criteria.

INSTRUCTOR CERTIFICATION

The Instructor Certification Training Program is an integral part of NCCER’s accreditation process. 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 NCCER Curriculum. This network of certified instructors assures that NCCER training programs meet the standards of instruction set by the industry. There are more than 5,500 master trainers and 55,000 craft instructors within the NCCER instructor network.

STANDARDIZED CURRICULUM

In cooperation with publishing partner Pearson, NCCER develops and publishes a world-class curriculum created by Subject Matter Experts representing contractors and schools from around the country. Subject Matter Experts ensure exceptional training programs that meet or exceed national industry standards. The NCCER Curriculum, which includes more than 60 craft areas, is taught worldwide 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 NCCER Curriculum include: competency-based modules with measurable objectives; modular format for flexibility and custom task training; compliance with the DOL Office of Apprenticeship requirements for time-based training; and portable, industry-recognized credentials. Instructors may teach a single module or the entire craft level and even customize their own training programs by combining modules across various craft areas. NCCER Curriculum can be easily adapted to cost effectively meet the needs of your program.

COMING IN 2014

NCCER is releasing several system improvements and new programs in 2014. The Registry is being fully rebuilt with enhanced user interface and functionality. A new digital environment will bring several of NCCER’s digital assets under one centralized system. In addition, online module testing will be released and the Contractors’ Workforce Development Assessment (CWDA) is scheduled for roll-out. Join NCCER’s mailing list at nccer.org for current developments throughout the year.

INDUSTRY-RECOGNIZED CREDENTIALS

NCCER maintains a portable and widely recognized credentialing and certification system through its Registry. This Registry assures portability of skills by providing transcripts, certificates and wallet cards to students who successfully complete the NCCER Curriculum through an accredited sponsor. These valuable industry credentials benefit students as they seek employment and build their careers. Over 10 million module completions have been delivered to students and craft professionals internationally.

INDUSTRY OUTREACH

Build Your Future is NCCER’s national recruitment and image enhancement initiative guiding America’s youth, displaced workers and military veterans to opportunities for advanced education and training that lead to long-term, rewarding careers in construction. Visit BYF.org for interactive resources including career descriptions, salaries, career paths and projected demand for craft professionals; downloadable posters, bookmarks, flyers and planning guides to use during Careers in Construction Month and throughout the year; and specific information on careers in construction tailored for parents, educators and military veterans.

COMING IN 2014

NCCER is releasing several system improvements and new programs in 2014. The Registry is being fully rebuilt with enhanced user interface and functionality. A new digital environment will bring several of NCCER’s digital assets under one centralized system. In addition, online module testing will be released and the Contractors’ Workforce Development Assessment (CWDA) is scheduled for roll-out. Join NCCER’s mailing list at nccer.org for current developments throughout the year.
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 NCCER Curricula and have been developed in conjunction with Prov®️, NCCER’s test development partner. An individual’s certification is documented through NCCER’s Registry. NCCER also offers a series of academic tests for secondary career and technical education. These tests can assist states in implementing statewide accountability systems.

### Assessments

#### Journey Level
- Commercial Carpenter
- Commercial Electrician
- Concrete Finisher*
- Drywall Mechanic*
- Heavy Equipment Operator:
  - Backhoe
  - Dozer
  - Dump Truck
  - Excavator
  - Forklift
  - Loader
  - Motor Grader
  - Roller
  - Scraper
- HVAC Technician
- Hydroblasting Technician
- Industrial Carpenter*
- Industrial Coating and Lining Application Specialist:
  - Level 1
  - Level 2
- Industrial Coating and Lining Specialist Level 2
- Industrial Electrician*
- Industrial Insulator*
- Industrial Ironworker
- Industrial Maintenance Electrical and Instrumentation Technician
- Industrial Maintenance Mechanic
- Industrial Maintenance Support Mechanic
- Industrial Millwright
- Industrial Painter
- Industrial Pipefitter*
- Instrumentation Fitter
- Instrument Technician
- Petrochemical Boilermaker
- Plumber
- Power Boilermaker
- Power Generation:
  - Maintenance Electrician
  - Maintenance Mechanic
- Power Line Worker:
  - Substation
  - Distribution
  - Transmission
- Reinforcing Ironworker*
- Scaffold Builder*
- Gas Maintenance Technician
- Gas Pipeline Operations
- Abnormal Operating Conditions-Control Center
- Abnormal Operating Conditions-Field
- Field Operator
- Control Center Operations Technician
- Mechanical Pipeline Technician
- Abnormal Operating Conditions-Control Center
- Abnormal Operating Conditions-Field

#### Pipeline

- Liquid & Gas
  - Electrical and Instrumentation Pipeline Technician
  - Corrosion Prevention Field Technician 1:
    - Installation
    - Measurement
  - Management
    - Foreman
    - Supervisor
    - Sustainable Construction Supervisor
  - Other
    - Hydroblasting
    - Core
    - Maritime Core

*These assessments are also available in Spanish.

### NCCER certifications for Mobile Crane, Tower Crane, Rigger & Signal Person

**NCCER’s Certification Programs offer:**
- Assessment and practical examination results available within 15 minutes of submission and no rush fees
- Real-time online verification
- Portable, industry-recognized credentials

**Mobile Crane Operator**
- 13 Equipment Specific Certifications (including capacity)

**Tower Crane Operator**
- Three-Equipment Certification Programs

**Rigger**
- Three-Level Certification Program

**Signal Person**
- Certification Program

Find out more at nccer.org/crane
Pearson Custom Library

Interested in creating a custom book?

Program Features Include:
- Flexibility
- Customize Your Cover
- Quality
- Free Evaluation Copy
- Quick Turnaround

1. Select a Craft
   Choose from over 125 titles!

2. Sequence the modules in any order
   Choose the modules you want, mix and match crafts and arrange them in the order you desire!

3. Customize your cover
   Select a cover and add your customized information!

4. Select Print, Digital or Both
   Choose your delivery format and place your order!

For more information and to get started, visit:
www.pearsoncustom.com  Keyword search: NCCER
A new and improved online supplement, **NCCERconnect** is currently available for over 20 titles and new titles will continue to be added throughout 2014. **NCCERconnect** includes a media rich Pearson eText and provides a range of visual, auditory, and interactive elements to enhance student learning and instructor delivery of craft training.

Whether you’re looking to keep training on schedule, save time for instructors, or provide students with an interactive and engaging self-study tool, **NCCERconnect** is the answer! It can be used in a variety of settings such as blended delivery, distance education, or in the traditional classroom environment!

Contact your Pearson representative for more details!

### Key features of NCCERconnect include:

- **Media rich Pearson eText** consists of the actual print book and integrated tools such as highlighting, notes, zoom, bookmarks, search capability, whiteboard view, and more!

- **Performance Reporting** helps save time with automatic grading and quickly identifies students that are struggling with visual reports for overall class achievement and individual student achievement.

- **Gradebook** displays students’ results of concept checks, review questions, and any additional quizzes/tests added to your course.

- **Media Library** features Active Figures (interactive exercises) and video presentations that demonstrate difficult skills and concepts!

- **Instructor Toolkit** provides easy access to lesson plans and lecture slide presentations.

- **Customization** of your course is easy and allows for maximum flexibility. Move existing folders or create new ones. Add/upload your own content or create additional tests/quizzes. It’s all here!

### All New Performance Reporting!

**NCCERconnect** is available for the following craft areas:

- Core Curriculum
- Carpentry
- Construction Technology
- Electrical
- Electronic Systems Technician
- Heavy Equipment Operations
- HVAC
- Plumbing
- Welding
- Your Role in the Green Environment
Instructor Resource Center

In order to access this site you will need to register with an access code. To get started visit www.nccerirc.com and select your craft area!

Here’s what you can download from this website.

For all craft areas

- TestGen software
- Module Exams
- Performance Profile Sheets

For revised craft areas starting in 2013

We are pleased to announce new and improved tools for educators. Moving forward, our new releases will feature comprehensive lesson plans and greatly enhanced PowerPoint presentations. These new resources are in addition to our standard instructor resources that include TestGen software, Module Exams, and Performance Profile Sheets.

The crafts that are immediately affected include:
Plumbing L2, Heavy Equipment Operations L2, HVAC L1, Carpentry L1, and all future publications

Please note: Moving forward all new releases will only have an ELECTRONIC Instructor Resource Access Card that will give access to all of the resources. There will be NO PRINTED Instructor Guides for new editions and titles.

For technical support call us at: 1-888-433-8435.

NCCER Online Bookstore

Visit our all new and redesigned online bookstore to browse our catalog, access help and support, find how-to videos and much more!

www.nccer.org/bookstore
Users of NCCER’s training program will notice that Module ID number assignments have been simplified to expedite credentials awarded for modules appearing in multiple crafts. Every module will retain the ID number assigned to it in its “parent” craft, unless there are changes to the Objectives, Performance Tasks, or content that warrant a new ID number when it is adopted into another craft. As a result, NCCER sponsors will find it easier to track training history, and end users should find it easier to track revisions from one edition to the next.

This Revision Map illustrates the Module ID assignments for the first 4 modules from Boilermaking 4, 2012 edition

<table>
<thead>
<tr>
<th>Module Sequence</th>
<th>Old Module ID #</th>
<th>New Module ID #</th>
<th>Module Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34401</td>
<td>34401-12</td>
<td>Advanced Mechanical Trade Math</td>
</tr>
<tr>
<td>2</td>
<td>NEW</td>
<td>34410-12</td>
<td>Advanced Rigging</td>
</tr>
<tr>
<td>3</td>
<td>34402</td>
<td>34402-12</td>
<td>Advanced Butlermaking Construction Drawings</td>
</tr>
<tr>
<td>4</td>
<td>34405</td>
<td>08402-07</td>
<td>Advanced Pipe Fabrication</td>
</tr>
</tbody>
</table>

The Suffix (12) indicates the year of publication.
This new Boilermaking module was assigned the next available Boilermaking number. Because 34409 was the last number used in the previous edition, 34410 is the next number available.
The prefix (34) indicates the craft identifier (Boilermaking).
When revised for 2012, this Boilermaking module was replaced with a module from Pipefitting. Advanced Pipe Fabrication retains its Module ID from Pipefitting (published in 2007), because the Objectives, Performance Tasks, and content are intact from that “parent” craft.

Craft Identifiers

The first two digits of the Module Identification Number indicate the “parent”, or source craft of that module. All NCCER Craft Identifiers are listed below.

<table>
<thead>
<tr>
<th>Alternative Energy</th>
<th>74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boilermaking</td>
<td>34</td>
</tr>
<tr>
<td>Carpenter</td>
<td>27</td>
</tr>
<tr>
<td>Concrete Finishing</td>
<td>23</td>
</tr>
<tr>
<td>Construction Craft Laborer</td>
<td>35</td>
</tr>
<tr>
<td>Construction Technology</td>
<td>68</td>
</tr>
<tr>
<td>Control Center Abnormal Operating Conditions</td>
<td>71</td>
</tr>
<tr>
<td>Core Curriculum</td>
<td>00</td>
</tr>
<tr>
<td>Drywall</td>
<td>45</td>
</tr>
<tr>
<td>Electrical</td>
<td>26</td>
</tr>
<tr>
<td>Electronic Systems Technician</td>
<td>33</td>
</tr>
<tr>
<td>Field Abnormal Operating Conditions</td>
<td>71</td>
</tr>
<tr>
<td>Fundamentals of Crew Leadership</td>
<td>46</td>
</tr>
<tr>
<td>Green/Sustainable Construction</td>
<td>70</td>
</tr>
<tr>
<td>Heavy Equipment Operations</td>
<td>22</td>
</tr>
<tr>
<td>Highway/Heavy Construction</td>
<td>36</td>
</tr>
<tr>
<td>HVAC</td>
<td>03</td>
</tr>
<tr>
<td>Hydroblasting</td>
<td>43</td>
</tr>
<tr>
<td>Industrial Coatings</td>
<td>69</td>
</tr>
<tr>
<td>Industrial Maintenance Mechanic</td>
<td>32</td>
</tr>
<tr>
<td>Instrumentation</td>
<td>12</td>
</tr>
<tr>
<td>Insulating</td>
<td>19</td>
</tr>
<tr>
<td>Ironworking</td>
<td>30</td>
</tr>
<tr>
<td>Maritime Industry Fundamentals</td>
<td>84</td>
</tr>
<tr>
<td>Maritime Pipefitting</td>
<td>85</td>
</tr>
<tr>
<td>Masonry</td>
<td>28</td>
</tr>
<tr>
<td>Millwright</td>
<td>15</td>
</tr>
<tr>
<td>Mobile Crane Operations</td>
<td>21</td>
</tr>
<tr>
<td>Painting (Commercial/Residential; Industrial)</td>
<td>07</td>
</tr>
<tr>
<td>Pipefitting</td>
<td>08</td>
</tr>
<tr>
<td>Pipefitter</td>
<td>02</td>
</tr>
<tr>
<td>Pipeline Field Operations</td>
<td>60</td>
</tr>
<tr>
<td>Pipeline Field Operations, Liquid</td>
<td>60</td>
</tr>
<tr>
<td>Pipeline Maintenance</td>
<td>62</td>
</tr>
<tr>
<td>Pipeline Mechanical</td>
<td>63</td>
</tr>
<tr>
<td>Pipeline Core</td>
<td>66</td>
</tr>
<tr>
<td>Pipeline Field Operations, Gas</td>
<td>67</td>
</tr>
<tr>
<td>Pipeline Field Operations, Liquid</td>
<td>60</td>
</tr>
<tr>
<td>Power Generation Management</td>
<td>50</td>
</tr>
<tr>
<td>Power Generation Maintenance Electrician</td>
<td>50</td>
</tr>
<tr>
<td>Power Generation 1 &amp; C Maintenance Technician</td>
<td>51</td>
</tr>
<tr>
<td>Power Generation Maintenance Mechanic</td>
<td>52</td>
</tr>
<tr>
<td>Power Line Worker Level One</td>
<td>49</td>
</tr>
<tr>
<td>Power Line Worker: Distribution</td>
<td>80</td>
</tr>
<tr>
<td>Power Line Worker: Substation</td>
<td>82</td>
</tr>
<tr>
<td>Power Line Worker: Transmission</td>
<td>81</td>
</tr>
<tr>
<td>Power Line Worker: Substation</td>
<td>82</td>
</tr>
<tr>
<td>Project Management</td>
<td>44</td>
</tr>
<tr>
<td>Project Supervision</td>
<td>MT200</td>
</tr>
<tr>
<td>Reinforcing Ironwork</td>
<td>39</td>
</tr>
<tr>
<td>Rigging</td>
<td>38</td>
</tr>
<tr>
<td>Safety</td>
<td>75</td>
</tr>
<tr>
<td>Scaffold</td>
<td>31</td>
</tr>
<tr>
<td>Sheet Metal</td>
<td>04</td>
</tr>
<tr>
<td>Site Layout</td>
<td>78</td>
</tr>
<tr>
<td>Solar Photovoltaic Installation</td>
<td>57</td>
</tr>
<tr>
<td>Sprinkler Fitting</td>
<td>18</td>
</tr>
<tr>
<td>Tower Crane</td>
<td>48</td>
</tr>
<tr>
<td>Weatherization</td>
<td>59</td>
</tr>
<tr>
<td>Welding</td>
<td>29</td>
</tr>
<tr>
<td>Wind Turbine Maintenance Technician</td>
<td>58</td>
</tr>
</tbody>
</table>

Product Design and Supplements

Each craft area is comprised of successive levels and each level is comprised of individual units of study called modules. Modules can be treated as separate task-training units because each one contains objectives and knowledge and performance tests. Instructors may teach a single module or the entire craft level and even customize their own training programs by combining modules across various craft areas. Customization is easy and cost effective.

Complimentary Supplements

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

- Competencies/Objectives Lists—include all competencies and comprehensive learning objectives for each craft.
- Performance Task Checklists—correlate to the performance tasks of NCCER’s 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.
- Revision Maps—track modules from revision to revision; they show how modules may have been incorporated into revisions, or indicate if they have been deleted.
## Core Curriculum: Introductory Craft Skills

### Core Curriculum

**Introductory Craft Skills**

- Core Curriculum is a prerequisite to most Level 1 completions and must be purchased separately.
- 72.5 Hours; plus 15 Elective/Optional Hours
- Revised: 2009, Fourth Edition
- Trainee Guide and individual trainee modules are full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.
- Lesson plans available for download and with IG to help instructors comply with the 2011 version of OSHA’s 10-hour Construction Industry training guidelines.
- A Spanish translation of the third edition is available. Please see NCCER’s online catalog for more information.
- A revision is underway & due in stock 2015

### Modules

<table>
<thead>
<tr>
<th>Module</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Construction Math</td>
<td>978-0-13-609877-5</td>
</tr>
<tr>
<td>Introduction to Hand Tools</td>
<td>978-0-13-609872-8</td>
</tr>
<tr>
<td>Introduction to Power Tools</td>
<td>978-0-13-609914-7</td>
</tr>
<tr>
<td>Introduction to Construction Drawings</td>
<td>978-0-13-609915-4</td>
</tr>
<tr>
<td>Basic Rigging</td>
<td>978-0-13-609916-1</td>
</tr>
<tr>
<td>Basic Communication Skills</td>
<td>978-0-13-609917-8</td>
</tr>
<tr>
<td>Basic Employability Skills</td>
<td>978-0-13-609919-2</td>
</tr>
<tr>
<td>Basic Safety</td>
<td>978-0-13-609921-5</td>
</tr>
<tr>
<td>Basic Communication Skills</td>
<td>978-0-13-609922-2</td>
</tr>
<tr>
<td>Basic Rigging</td>
<td>978-0-13-609927-7</td>
</tr>
<tr>
<td>Basic Communication Skills</td>
<td>978-0-13-609928-4</td>
</tr>
<tr>
<td>Basic Employability Skills</td>
<td>978-0-13-609929-1</td>
</tr>
<tr>
<td>Basic Safety</td>
<td>978-0-13-609930-7</td>
</tr>
<tr>
<td>Basic Rigging</td>
<td>978-0-13-609936-2</td>
</tr>
</tbody>
</table>

### Product Supplements

- **PowerPoint® Presentation Slides**
  - $40

### Instructor’s Guide(s) listed above. The following ISBN and pricing

- **HARDCOVER**
  - Trainee Guide: $54
  - Instructor Guide: $51
  - **PAPERBACK**
    - Trainee Guide: $55
    - Instructor Guide: $51

- **NCCEConnect (See p. 7 for details)**
  - For instructor access only, contact your Pearson Representative.

- **Trainee Guide Hardcover + Access Card Package:** $79
- **Trainee Guide Paperback + Access Card Package:** $76
- **IG Paperback + Access Card Package:** $51
- **Access Card ONLY for Trainee Guide:** $54
- **ELECTRONIC Access Code ONLY for Trainee Guide:** $54

For more information, please visit www.nccer.org/bookstore.
Core Curriculum Companions

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 on a stand-alone basis or in combination with the Core Curriculum.

**Applied Construction Math**

Published: 2006


**Trainee Guide:** $27

**Instructor’s Guide:** $27

**Pocket Guide:** $14

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. It reviews the pride and excitement of a career in construction.

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 craft professionals who explain firsthand why construction is a good career choice.

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.

---

**Safety Orientation**

10 Hours

**PAPERBACK** ISBN 978-0-13-160649-4

**Trainee Workbook:** $29

**Instructor’s Handbook:** $29

This workbook is designed for employees entering the construction industry and has been reviewed and updated with input from construction and training professionals. First Impressions: Getting a Job features tips on finding a job, interviewing, filling out applications, and resume writing.

See p. 97 for more information.

---

**Your Role in the Green Environment**

15 Hours

Updated to LEED Version 4!

**PAPERBACK** ISBN 978-0-13-602303-6

**Instructor’s Guide:** $27

**Trainee Guide:** $27

For instructor access only, contact your Pearson Representative.

---

**Tools for Success**

Critical Skills for the Construction Industry

Revised: 2009, Third Edition

**PAPERBACK** ISBN 978-0-13-610649-4

**Trainee Workbook:** $29

**Instructor’s Handbook:** $29

This workbook is designed for employees entering the construction industry and has been reviewed and updated with input from construction and training professionals. First Impressions: Getting a Job features tips on finding a job, interviewing, filling out applications, and resume writing.

The Instructor’s Handbook includes an annotated instructor’s outline, recommended teaching schedules, answers to quizzes, and tips and ideas for enhancing class activities.

---

**Stay Connected:**

To Order Call: 1-800-922-0579 www.nccer.org/bookstore
Boilermaking

**MODULES**

**LEVEL 1**

**Boilermaking Safety** (12.5 Hours)

Trainee $19  
Instructor $19  

*Provides an overview of boilermaker safety. Describes the behavior of boilers, boiler trains, and pressurized parts.*

**Boilermaking Tools** (15 Hours)

Trainee $19  
Instructor $19  

*Introduces and describes the boilermaker’s hand and power tools. Explains the safe use of tools.*

**Basic Materials** (10 Hours)

Trainee $19  
Instructor $19  

*Describes the properties and applications of basic materials used in boilermaking.*

**Oxyfuel Cutting** (17.5 Hours)

Trainee $19  
Instructor $19  

*Introduces oxyfuel cutting equipment and uses. Describes the safe and effective cutting of metal.*

**Cutting and Fitting Gaskets** (12.5 Hours)

Trainee $19  
Instructor $19  
ISBN 978-0-13-213699-0

*Teaches the techniques for cutting and fitting gaskets.*

**LEVEL 2**

**Boilermaking Safety** (12.5 Hours)

Trainee $19  
Instructor $19  

*Continues the safety training for boilermakers. Focuses on the safe handling of pressure equipment.*

**Boilermaking Tools** (15 Hours)

Trainee $19  
Instructor $19  

*Deepens the understanding of boilermaker tools and their safe use.*

**Basic Materials** (10 Hours)

Trainee $19  
Instructor $19  

*Expands the knowledge on basic materials used in boilermaking.*

**Oxyfuel Cutting** (17.5 Hours)

Trainee $19  
Instructor $19  

*Builds on the oxyfuel cutting concepts with more advanced techniques.*

**Cutting and Fitting Gaskets** (12.5 Hours)

Trainee $19  
Instructor $19  
ISBN 978-0-13-213699-0

*Further enhances the skills in cutting and fitting gaskets.*

**LEVEL 3**

**Boilermaking Safety** (12.5 Hours)

Trainee $19  
Instructor $19  

*Continues the safety training with a focus on more complex tasks.*

**Boilermaking Tools** (15 Hours)

Trainee $19  
Instructor $19  

*Presents advanced boilermaker tools and their applications.*

**Basic Materials** (10 Hours)

Trainee $19  
Instructor $19  

*Explores the properties and uses of advanced materials.*

**Oxyfuel Cutting** (17.5 Hours)

Trainee $19  
Instructor $19  

*Introduces cutting with advanced oxyfuel equipment.*

**Cutting and Fitting Gaskets** (12.5 Hours)

Trainee $19  
Instructor $19  
ISBN 978-0-13-213699-0

*Concludes the gasket cutting section with advanced techniques.*

---

**Curriculum Notes**

- 182.5 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
- Revised: 2010, Second Edition
- Trainee Guide and individual trainee modules are full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

---

**PAPERBACK**

Trainee Guide: $67  
Instructor’s Guide: $94  

**Product Supplements**

- PowerPoint® Presentation Slides  

---

**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.

**Introduction to Boilermaking** (10 Hours)

Trainee $19  
Instructor $19  

*Provides an overview of the boilermaker craft, including a description of career opportunities.*

**Boilermaking Safety** (12.5 Hours)

Trainee $19  
Instructor $19  

*Continues the safety training for boilermakers. Focuses on the safe handling of pressure equipment.*

**Boilermaking Tools** (15 Hours)

Trainee $19  
Instructor $19  

*Introduces boilermaker’s hand and power tools.*

**Basic Materials** (10 Hours)

Trainee $19  
Instructor $19  

*Explores the properties and uses of basic materials.*

**Oxyfuel Cutting** (17.5 Hours)

Trainee $19  
Instructor $19  

*Introduces oxyfuel cutting equipment and uses. Describes the safe and effective cutting of metal.*

**Cutting and Fitting Gaskets** (12.5 Hours)

Trainee $19  
Instructor $19  
ISBN 978-0-13-213699-0

*Teaches the techniques for cutting and fitting gaskets.*

---

**Base Metal Preparation** (10 Hours)

Trainee $19  
Instructor $19  

*(Module ID 34107-10) Describes how to clean and prepare base metals for cutting and welding.*

**Welding Basics** (22.5 Hours)

Trainee $19  
Instructor $19  
ISBN 978-0-13-213701-0

*(Module ID 34108-10) Describes welding and cutting processes and related equipment. Includes filler metals, joint design, and the codes that govern welding practices.*

**Fasteners and Anchors** (5 Hours)

Trainee $19  
Instructor $19  

*(Module ID 34205-11) Covers threaded and non-threaded fasteners and anchoring devices. Explains how to select fasteners and anchors for given applications. Describes how to install threaded, non-threaded, and insulated fasteners and anchors.*

**Welding Symbols** (5 Hours)

Trainee $19  
Instructor $19  

*(Module ID 34206-11) Explains how to read symbols on welding drawings, specifications, and welding procedure specifications. Describes the symbols for fillet welds, groove welds, miscellaneous other welds, and non-destructive tests.*

**Socket Weld Pipe Fabrication** (25 Hours)

Trainee $19  
Instructor $19  

*(Module ID 34207-11) Describes different types of socket weld piping materials and fittings and how to read socket weld piping drawings. Explains how to determine pipe lengths between socket weld fittings, as well as how to mate socket weld fittings to pipe.*

**Butt Weld Pipe Fabrication** (40 Hours)

Trainee $19  
Instructor $19  

*(Module ID 34208-11) Covers preparing pipe ends for butt welding; determining pipe lengths between butt weld fittings; and using welding jigs to align pipe and butt weld fittings for welding. Explains how to select and install backging rings.*

**Tubeweld Preparation and Fitting** (15 Hours)

Trainee $19  
Instructor $19  

*(Module ID 34209-11) Describes methods used to gain access to boiler tubes needing repair, as well as methods used to prepare boiler tubes for replacement. Explains how to fit a section of boiler tube. Describes welding procedures for making butt welds on standard carbon steel tubes and composite tubes.*

**Arc Carbon Arc Cutting and Gouging** (12.5 Hours)

Trainee $19  
Instructor $19  
ISBN 978-0-13-213796-0

*(Module ID 34210-11) Describes air carbon arc cutting (CACA) equipment and processes. Explains how to select and install CACA electrodes and how to prepare the work area and CACA equipment for safe operation. Provides instructions for using CACA equipment for washing and gouging activities.*
Boilemaking Level 3 (continued)

Product Supplements

PowerPoint® Presentation Slides

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.

### Plasma Arc Cutting (PAC) (10 Hours)
- Trainee $19
- Instructor $19
- Module ID 29103-09: from Welding Level One

### Boiler Pressure Components (25 Hours)
- Trainee $19
- Instructor $19
- Module ID 34301-11: Describes the pressure components of a boiler system and their locations. Explains the procedures required to repair pressure components of a boiler.

### Boiler Nonpressure Components (15 Hours)
- Trainee $19
- Instructor $19
- Module ID 34302-11: Describes the nonpressure components of a boiler system and their locations. Explains the procedures required to repair pressure components of a boiler.

### Boiler Auxiliaries (25 Hours)
- Trainee $19
- Instructor $19
- ISBN 978-0-13-266368-7
- Module ID 34306-11: Describes the air flow systems within a boiler system and the different fuels used to fire boiler system furnaces. Describes ash removal systems and the equipment used to protect the environment. Covers the feed water system into a boiler and the blow down from a boiler system.

### BRIL (Brick, Refractory, Insulation, and Logging) (5 Hours)
- Trainee $19
- Instructor $19
- Module ID 34305-11: Describes types of BRIL and explains their functions. Also addresses hazards associated with BRIL.

### Advanced Tube Work (20 Hours)
- Trainee $19
- Instructor $19
- Module ID 34303-11: Explains the methods used to identify problem tubes and extract them. Also describes the methods used for replacing and plugging tubes.

### Testing Piping Systems and Equipment (20 Hours)
- Trainee $19
- Instructor $19
- Module ID 34308-11: Lists pretest requirements for boiler system piping systems and equipment. Describes service and flow tests, head pressure tests, and hydrostatic tests performed on boiler system piping systems and equipment.

### L4 BOILERMAKING

#### Curriculum Notes
- 165 Hours
- Revised: 2012, Second Edition
- Trainee Guide and trainee modules are in full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

#### PAPERBACK
- Trainee Guide: $94
- Instructor Guide: $94

#### Product Supplements
- PowerPoint® Presentation Slides

### Modules

#### Rigging (22.5 Hours)
- Trainee $19
- Instructor $19

#### Testing Piping Systems and Equipment (25 Hours)
- Trainee $19
- Instructor $19
- Module ID 34307-11: Explains the functions of towers and exchangers and the basic distillation process. Describes various types of towers and exchangers and their components.

#### Advanced Boilermaking Construction Drawings (20 Hours)
- Trainee $19
- Instructor $19
- Module ID 34402-12: Covers symbols and abbreviations used on piping and instrumentation drawings (P&IDs) and piping arrangement drawings. Explains how to read and interpret different types of construction drawings. Explains how to sketch an isometric drawing from a plan view drawing, and how to calculate line lengths from isometric drawings.

#### Advanced Pipe Fabrication (20 Hours)

#### Stress Relieving (10 Hours)
- Trainee $19
- Instructor $19
- Module ID 34406-12: Covers metal distortion and ways to prevent it. Explains thermal growth in metals, and how to calculate thermal growth in given metals. Explains how misalignment creates stress in metals. Describes ways to relieve stress in piping that is experiencing distortion due to welding, thermal growth, or misalignment.

#### Quality Assurance (10 Hours)
- Trainee $19
- Instructor $19
- Module ID 34407-12: Covers codes governing welding and boilers. Describes weld imperfections and their causes. Identifies and explains different nondestructive and destructive testing methods. Explains how to make visual inspections of fillet welds. Describes welder qualification testing, and stresses the importance of quality workmanship.

#### Advanced Exchangers (25 Hours)
- Trainee $19
- Instructor $19
- Module ID 34411-12: Identifies different types of heat exchangers and their components. Describes methods used to test exchangers, and how to pull exchanger bundles. Explains how to replace a flange and a nozzle on an exchanger.

#### Advanced Towers (25 Hours)
- Trainee $19
- Instructor $19
- Module ID 34412-12: Identifies different types of towers and their components. Explains how to remove and replace different types of packing used in towers. Describes methods used to make field repairs to tower trays. Explains how to remove a tower distributor for maintenance.

#### Fundamentals of Crew Leadership (20 Hours)
- Trainee $40
- Instructor $40

#### Advanced Boilermaking Level 3 (continued)

To Order Call: 1-800-922-0579

Stay Connected:  

www.nccer.org/bookstore
Carpentry

L1 CARPENTRY

LEVEL 1

Curriculum Notes

• 235 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
• Revised: 2013, Fifth Edition
• Trainee Guide and individual trainee modules are full color.
• Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.
• A Spanish translation of the fourth edition is available. Please see NCCER’s online catalog for more information.

HARDCOVER ISBN
Trainee Guide: $67
978-0-13-340328-0

PAPERBACK ISBN
Trainee Guide: $67
978-0-13-340435-7
Instructor’s Res. Access Card: $67
978-0-13-340401-2

NCCERconnect (See p. 7 for details) ISBN
For instructor access only, contact your Pearson Representative.
Trainee Guide Hardcover
+ Access Card Package: $94
978-0-13-340940-6
Trainee Guide Paperback
+ Access Card Package: $92
978-0-13-340939-0
Access Card ONLY for Trainee Guide: $67
(does not include print book)
978-0-13-340393-0
ELECTRONIC Access Code ONLY for Trainee Guide: $67
(must be ordered electronically via OASIS; does not include print book)
978-0-13-340436-4

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.

Orientation to the Trade (2.5 Hours)
Trainee S$9
978-0-13-340299-5
Instructor S$9
978-0-13-340309-1
(Module ID 27101-13) Reviews the history of the trade, describes the apprenticeship program, identifies career opportunities for carpentry and construction workers, and lists the skills, responsibilities, and characteristics a worker should possess. Emphasizes the importance of safety in the construction industry.

Building Materials, Fasteners, and Adhesives (20 Hours)
Trainee S$19
Instructor S$19
978-0-13-340300-8
978-0-13-340310-7
(Module ID 27102-13) Introduces the building materials used in construction work, including lumber, sheet materials, engineered wood products, structural concrete, and structural steel. Also describes the fasteners and adhesives used in construction work. Discusses the methods of squaring a building.

Hand and Power Tools (10 Hours)
Trainee S$19
Instructor S$19
978-0-13-340301-5
978-0-13-340314-4
(Module ID 27103-13) Provides descriptions of hand tools and power tools used by carpenters. Emphasizes safe and proper operation, as well as care and maintenance.

Introduction to Construction Drawings, Specifications, and Layout (22.5 Hours)
Trainee S$19
Instructor S$19
978-0-13-340302-2
978-0-13-340312-1
(Module ID 27104-13) Covers the techniques for reading and using construction drawings and specifications with an emphasis on drawings and information relevant to the carpentry trade. Introduces quantity takeoffs.

Floor Systems (25 Hours)
Trainee S$19
Instructor S$19
978-0-13-340303-9
978-0-13-340318-8
(Module ID 27105-13) Covers framing basics and the procedures for laying out and constructing a wood floor using common lumber, as well as engineered building materials.

Wall Systems (10 Hours)
Trainee S$19
Instructor S$19
978-0-13-340304-6
978-0-13-340319-5
(Module ID 27111-13) Describes procedures for laying out and framing walls, including rough-in door and window openings, constructing corners, partition Ts, and bracing walls. Includes the procedure to estimate the materials required to frame walls.

Ceiling Joist and Roof Framing (47.5 Hours)
Trainee S$19
Instructor S$19
978-0-13-340305-3
978-0-13-340315-2
(Module ID 27112-13) Describes types of roofs and provides instructions for laying out rafter for gable roofs, hip roofs, and valley intersections. Covers stick-built and truss-built roofs. Includes the basics of roof sheathing installation.

Basic Stair Layout (12.5 Hours)
Trainee S$19
Instructor S$19
978-0-13-340306-0
978-0-13-340316-6
(Module ID 27110-13) Introduces types of stairs and common building code requirements related to stairs. Focuses on techniques for measuring and calculating rise, run, and stairwell openings, laying out stringers, and fabricating basic stairways.

Introduction to Building Envelope Systems (12.5 Hours)
Trainee S$19
Instructor S$19
978-0-13-340307-7
978-0-13-340318-3
(Module ID 27109-13) Introduces the concept of the building envelope and explains its components. Describes types of windows, skylights, and exterior doors, and provides instructions for installation.

L2 CARPENTRY FRAMING & FINISHING

LEVEL 2

Curriculum Notes

• 210 Hours
• Optional Residential Path: 170 Hours
• Optional Commercial Path: 150 Hours
• Revised: 2013, Fifth Edition
• Trainee Guide and individual trainee modules are full color.
• Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.

HARDCOVER ISBN
Trainee Guide: $96
978-0-13-340465-4

PAPERBACK ISBN
Trainee Guide: $94
978-0-13-340432-0
Instructor’s Res. Access Card: $94
978-0-13-340430-2

NCCERconnect (See p. 7 for details) NEW!
For instructor access only, contact your Pearson Representative.
Trainee Guide Hardcover
+ Access Card Package: $121
978-0-13-340942-0
Trainee Guide Paperback
+ Access Card Package: $119
978-0-13-340938-3
Access Card ONLY for Trainee Guide: $96
(does not include print book)
978-0-13-340934-7
ELECTRONIC Access Code ONLY for Trainee Guide: $96
(must be ordered electronically via OASIS; does not include print book)
978-0-13-340437-10

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.

Commercial Drawings Elective for Residential Path (25 Hours)
Trainee S$19
978-0-13-377929-5
Instructor S$19
978-0-13-377918-9
(Module ID 27201-13) Describes how to read and interpret a set of commercial drawings and specifications.

Roofing Applications Elective for Commercial Path (25 Hours)
Trainee S$19
978-0-13-377902-8
Instructor S$19
978-0-13-377919-6
(Module ID 27202-13) Describes how to properly prepare the roof deck and install roofing for residential and commercial buildings.

Thermal and Moisture Protection (7.5 Hours)
Trainee S$19
978-0-13-377903-5
Instructor S$19
978-0-13-377921-9
(Module ID 27203-13) 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.
Carpentry Level 2 (continued)

**Exterior Finishing** *Elective for Commercial Path* (35 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27204-13) Covers the various types of exterior finish materials and their installation procedures, including wood, metal, vinyl, and fiber-cement siding.

**Cold-Formed Steel Framing** (15 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27205-13) Describes the types and grades of steel framing materials, and includes instructions for selecting and installing metal framing for interior and exterior walls, loadbearing and non-bearing walls, partitions, and other applications.

**Drywall Installation** (15 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27206-13) Describes the various types of gypsum drywall, their uses, and the fastening devices and methods used to install them. Also contains detailed instructions for installing drywall on walls and ceilings using nails, drywall screws, and adhesives. A discussion of fire- and sound-rated walls is also presented.

**Drywall Finishing** (17.5 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27207-13) Describes the materials, tools, and methods used to finish and patch gypsum drywall. A discussion of both automatic and manual taping and finishing tools is presented.

**Doors and Door Hardware** (20 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27208-13) Describes 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. A discussion on the installation of wood doors, folding doors, and pocket doors is also presented.

**Suspended Ceilings** *Elective for Residential Path* (15 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27209-13) Describes 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.

**Window, Door, Floor, and Ceiling Trim** (25 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27210-13) Describes the different types of trim used in finish work and focuses on the proper methods for selecting, cutting, and fastening trim to provide a professional finished appearance.

**Cabinet Installation** (10 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27211-13) Provides detailed instructions for the selection and installation of base and wall cabinets and countertops.

---

**L3 CARPENTRY FORMS**

**Curriculum Notes**
- **REVISED!**
- **160 Hours**
- **To Be Revised: Summer 2014, Fifth Edition**
- **Trainee Guide and individual trainer modules are full color.**
- **Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.**
- **A Spanish translation of the fourth edition is available. Please see NCCER’s online catalog for more information.**

**PAPERBACK**
- **Trainee Guide:** $94
- **Instructor’s Res. Access Card:** $94

**NCCEConnect** *(See p. 7 for details)*
- **NEW!**
- **For instructor access only, contact your Pearson Representative.**

**Trainee Guide Paperback + Access Card Package:** $119

**Access Card ONLY for Trainee Guide:** $94

**ELECTRONIC Access Code ONLY for Trainee Guide:** $94

**Instructor’s Resource Access Card**: $119 (does not include print book)

---

**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.**

**Properties of Concrete** (10 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27303-14) Describes the properties, characteristics, and uses of cement, aggregates, and other materials used in different types of concrete. Covers procedures for estimating concrete volume and testing freshly mixed concrete, as well as methods and materials for curing concrete.

**Reinforcing Concrete** (15 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27304-14) Explains the selection and uses of different types of reinforcing materials. Describes requirements for bending, cutting, splicing, and tying reinforcing steel and the placement of steel in footings and foundations, walls, columns, and beams and girders.

**Foundations and Slab-on-Grade** (20 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27307-14) Covers basic site layout safety, tools, and methods; layout and construction of deep and shallow foundations; types of foundation forms; layout and formation of slabs-on-grade; and forms used for curbing and paving.

**Vertical Formwork** (22.5 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27308-14) Covers the applications and construction methods for types of forming and form hardware systems for walls, columns, and stairs, as well as slip and climbing forms. Provides an overview of the assembly, erection, and stripping of form systems.

**Horizontal Formwork** (15 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27309-14) Describes elevated decks and formwork systems and methods used in their construction. Covers joist, pan, beam and slab, flat slab, composite slab, and specialty form systems and provides instructions for the use of flying decks, as well as shoring and reshoring systems.

**Tilt-up Wall Panels** (17.5 Hours)
- **Trainee $19**
- **Instructor $19**
- (Module ID 27310-14) Describes how tilt-up concrete construction is used and how tilt-up panels are formed, erected, and braced. Covers the installation of rebar and types of embedments used to lift and brace the panels. Also covers methods used to create architectural and decorative treatments.

---

To Order Call: 1-800-922-0579
Stay Connected: www.nccer.org/bookstore
Advanced Roof Systems (20 Hours)
(Module ID 27403-08) Covers commercial roofing materials and Structures and describes the procedures for installing commercial roofing such as lap seam, standing seam, and built-up roofs.

Advanced Wall Systems (25 Hours)
(Module ID 27404-08) Covers installation of a variety of finishing materials, including concrete masonry units and brick. Also covers installation of curtain walls and fire-rated commercial construction.

Advanced Stair Systems (25 Hours)
(Module ID 27405-08) Provides extensive coverage of the materials and techniques used in finishing wooden staircases. Also covers a variety of stair systems used in commercial construction.

Introduction to Light Equipment (10 Hours)
(Module ID 27406-08) Introduces light construction equipment, including the aerial lift, skid steer loader, electric power generator, compressor, compactor, and forklift. An overview of general safety, operation, and maintenance procedures is provided.

Welding (25 Elective Hours)
(Module ID 27407-08) 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.

Commercial Finish Work (5 Hours)
(Module ID 27408-08) Introduces specialized finish materials used on interior and exterior walls, ceilings, and floors of commercial buildings.

Site Preparation (7.5 Hours)
(Module ID 27409-08) 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 crime-related concerns.

Fundamentals of Crew Leadership (20 Hours)
(Module 46101-11) Includes NCCER performance tests, and numerous teaching tips.

Ordering information for Carpentry Level 4, Fifth Edition, due in stock late 2014:

Trainee Guide: $67
Instructor’s Res. Access Card: $67

NCCEconnect (See p. 7 for details) ISBN TBD
For instructor access only, contact your Pearson Representative.
Trainee Guide Paperback + Access Card Package: $90
Access Card ONLY for Trainee Guide: $67
(does not include print book)

ELECTRONIC Access Code ONLY for Trainee Guide: $67
(must be ordered electronically via OASIS; does not include print book)

To Order Call: 1-800-922-0579 www.nccer.org/bookstore
Stay Connected: www.nccer.org/bookstore

**Curriculum Notes**
- 186 Hours (161 required; 25 elective)
- Revised 2008, Fourth Edition
- A revision is underway and due in stock late 2014.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

Trainee Guide: $94
Instructor’s Guide: $94

**NCCEconnect** (See p. 7 for details) ISBN
For instructor access only, contact your Pearson Representative.
Access Card ONLY for Trainee Guide: $94
(does not include print book)

**ELECTRONIC** Access Code ONLY for Trainee Guide: $94
(must be ordered electronically via OASIS; does not include print book)

**Product Supplements**

**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.

**Site Layout One—Distance Measurement and Leveling (22.5 Hours)**
(Module ID 27401-08) Covers the principles, equipment, and methods used to perform differential leveling. Also covers the layout responsibilities of surveyors, field engineers, and carpenters; interpretation and use of site/plot plan drawings; the use of laser instruments; and methods used for on-site communication.

**Site Layout Two—Angular Measurement (30 Hours)**
Instructor $19 ISBN 978-0-13-603834-4
(Module ID 27402-08) Covers the principles, equipment, and methods used to perform site layout tasks that require angular and distance measurements. Tasks include laying out building lines and determining elevations by trigonometric leveling. The use of transit, theodolites, electronic distance measurement, and total stations are covered. Reviews trade mathematics needed to perform calculations related to angular measurements.
L1  CONCRETE FINISHING

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 p. 10 for ordering information.)
• Published: 1998
• A Spanish translation is available. Please see NCCER’s online catalog for more information.
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK  ISBN
Instructor’s Guide: $67  978-0-13-010246-1

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.

Introduction to Concrete Construction and Finishing (10 Hours)
(Module ID 23101) 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.

Safety Requirements (5 Hours)
(Module ID 23102) 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.

Properties of Concrete (10 Hours)
(Module ID 23103) 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.

Tools and Equipment (25 Hours)
(Module ID 23104) Describes tools and equipment used in the production, placing, and curing of concrete. Explains safe operation and maintenance requirements. Provides opportunities for hand tool operation and demonstration of larger pieces of power equipment.

Preparing for Placement (12.5 Hours)
(Module ID 23105) Details the methods and procedures used to prepare for placing concrete. Covers site layout, forms requirements, and subgrade preparation. Describes requirements for joints and reinforcement. Explains how to order concrete from a mixing or batch plant.

Placing Concrete (12.5 Hours)
(Module ID 23106) Presents requirements and methods for properly placing concrete. Includes information on conveying and placing fresh concrete using equipment such as wheelbarrows, pumps and conveyors. Describes techniques for spreading, consolidating, and striking off concrete.

Finishing, Part One (20 Hours)
(Module ID 23107) Describes basic finishing techniques for slabs and other horizontal structures. Explains the proper use of floats, trowels, edges, and groovers. Discusses requirements for cutting joints using different types of saws. Provides hands-on practice for finishing concrete slabs.

Curing and Protecting Concrete (5 Hours)
(Module ID 23108) Introduces methods and procedures used in curing and protecting concrete. Covers curing commonly performed for both horizontal and vertical placement. Describes techniques for protecting concrete during hot and cold weather.

Introduction to Troubleshooting (5 Hours)
Instructor S19  ISBN 978-0-13-010272-0
(Module ID 23109) Describes problems of placing, finishing, and curing. Defines symptoms of problems and discusses their causes. Presents ways to reduce or eliminate these problems.

L2  CONCRETE FINISHING

Curriculum Notes

• 165 Hours
• Published: 1999
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK  ISBN

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.

Properties of Concrete, Part Two (7.5 Hours)
(Module ID 23201) Describes the physical and chemical properties of materials used in a concrete mix. Includes descriptions of chemical and mineral admixtures, lightweight concrete, high strength concrete, flowable fill, and types of paving materials. Discusses expected results of the use of admixtures.

Estimating Concrete Quantities (10 Hours)
(Module ID 23202) Covers the methods and techniques used in estimating materials quantities for concrete construction. Explains the use of plans and drawings as well as math calculations. Gives example calculations for estimating quantities of concrete for curb and gutter, slabs, slab, wall footings, and columns.

Forming (20 Hours)
(Module ID 23203) 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.

Site Concrete (30 Hours)
(Module ID 23204) Includes descriptions and techniques for forming, constructing, and finishing steps and stairs, curbs and gutters, sidewalks and driveways, and low vertical structures.

Architectural Finishes (20 Hours)
(Module ID 23205) Introduces architectural concrete and architectural finishes. Discusses the surface classes of architectural concrete. Includes special surface treatments, special forms, and form liners.

Industrial Floors (22.5 Hours)
(Module ID 23206) Describes the construction and finishing of this special class of concrete work, including special tools and finishing techniques. Explains procedures for preparation, joint layout, placing, finishing, and curing.

Superflat Floors (22.5 Hours)
(Module ID 23207) 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.
Concrete Finishing Level 2 (continued)

Surface Treatments (12.5 Hours)
(Module ID 23208) Provides an overview of surface treatments applied to concrete structures. Includes the requirements for and application of dry shakes, self-leveling toppings, epoxies, and shotcrete.

Quality Control (10 Hours)
(Module ID 23209) Introduces the ideas and tasks related to sampling, testing, and inspecting concrete and its component materials. Describes types of specifications, along with the standard procedures for sampling and testing concrete mix. Covers inspection procedures for forms, construction methods, and finishing.

Making Repairs (10 Hours)
Instructor $19 ISBN 978-0-13-015068-4
(Module ID 23210) 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.

Construction Craft Laborer

CORE CURRICULUM
Basic Safety (Module ID 00101-09)
Introduction to Construction Math (Module ID 00102-09)
Introduction to Hand Tools (Module ID 00103-09)
Introduction to Power Tools (Module ID 00104-09)
Introduction to Construction Drawings (Module ID 00105-09)
Basic Rigging (Module ID 00106-09)
Basic Communication Skills (Module ID 00107-09)
Basic Employability Skills (Module ID 00108-09)
Introduction to Materials Handling (Module ID 00109-09)

L1 CONSTRUCTION CRAFT LABORER LEVEL 1
Curriculum Notes
• 167.5 Hours (Includes 72.5 hours of Core Curriculum.)
• Updated: 2009
• Construction Craft Laborer is printed on demand and available in binder format only.

BINDER ISBN
Instructor’s Guide: $105 978-0-13-016096-6

L2 CONSTRUCTION CRAFT LABORER LEVEL 2
Curriculum Notes
• 150 Hours
• Updated: 2009
• Construction Craft Laborer is printed on demand and available in binder format only.

BINDER ISBN
Drywall

**CONSTRUCTION TECHNOLOGY**

**Current Technology**

- 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.
- 420 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for completion and must be purchased separately. See p. 10 for ordering information.)
- Revised: 2009, Third Edition

**Product Supplements**

<table>
<thead>
<tr>
<th>Description</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELECTRONIC Access Code ONLY for Trainee Guide: $140 (must be ordered electronically via OASIS; does not include print book)</td>
<td>978-0-13-292121-3</td>
</tr>
</tbody>
</table>

**MODULES**

| Site Layout One—Distance Measurement and Leveling (22.5 Hours) | (Module ID 68101-09) (27401-08 Core Curriculum Level One) |
| Introduction to Concrete, Reinforcing Materials, and Forms (5 Hours) | (Module ID 68102-09) (27108-06 Core Curriculum Level One) |
| Handling and Placing Concrete (22.5 Hours) | (Module ID 68103-09) (27305-07 Core Curriculum Level One) |
| Introduction to Masonry (20 Hours) | (Module ID 68104-09) (28101-04 Masonry Level One) |
| Masonry Units and Installation Techniques (60 Hours) | (Module ID 68105-09) (28105-04 Masonry Level One) |
| Floor Systems (25 Hours) | (Module ID 68106-09) (27105-06 Core Curriculum Level One) |
| Wall and Ceiling Framing (20 Hours) | (Module ID 68107-09) (27106-06 Core Curriculum Level One) |

**Product Supplements**

<table>
<thead>
<tr>
<th>Description</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerPoint® Presentation Slides</td>
<td>978-0-13-609083-0</td>
</tr>
<tr>
<td></td>
<td>$40</td>
</tr>
</tbody>
</table>

**NCCERConnect**

- See p. 7 for details
- For instructor access only, contact your Pearson Representative.
- Trainee Guide Hardcover + Access Card Package: $165
- PAPERBACK + Access Card Package: $140

**Construction Technology**

- Access Card ONLY for Trainee Guide: $140 (does not include print book)
- ELECTRONIC Access Code ONLY for Trainee Guide: $140 (must be ordered electronically via OASIS; does not include print book)

**MODULES**

| Site Layout One—Distance Measurement and Leveling (22.5 Hours) | (Module ID 68101-09) (27401-08 Carpenter Level One) |
| Introduction to Concrete, Reinforcing Materials, and Forms (5 Hours) | (Module ID 68102-09) (27108-06 Carpenter Level One) |
| Handling and Placing Concrete (22.5 Hours) | (Module ID 68103-09) (27305-07 Carpenter Level Three) |
| Introduction to Masonry (20 Hours) | (Module ID 68104-09) (28101-04 Masonry Level One) |
| Masonry Units and Installation Techniques (60 Hours) | (Module ID 68105-09) (28105-04 Masonry Level One) |
| Floor Systems (25 Hours) | (Module ID 68106-09) (27105-06 Carpenter Level One) |
| Wall and Ceiling Framing (20 Hours) | (Module ID 68107-09) (27106-06 Carpenter Level One) |

**Product Supplements**

<table>
<thead>
<tr>
<th>Description</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerPoint® Presentation Slides</td>
<td>978-0-13-214321-9</td>
</tr>
<tr>
<td></td>
<td>$40</td>
</tr>
</tbody>
</table>

Drywall

**CONSTRUCTION TECHNOLOGY**

**Curriculum Notes**

- 147 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for completion and must be purchased separately. See p. 10 for ordering information.)
- Published: 2007
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.
- A Spanish translation is available. Please see NCCER’s online catalog for more information.

**Product Supplements**

<table>
<thead>
<tr>
<th>Description</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELECTRONIC Access Code ONLY for Trainee Guide: $140 (must be ordered electronically via OASIS; does not include print book)</td>
<td>978-0-13-609952-9</td>
</tr>
</tbody>
</table>

**MODULES**

| Site Layout One—Distance Measurement and Leveling (22.5 Hours) | (Module ID 68101-09) (27401-08 Core Curriculum Level Four) |
| Introduction to Concrete, Reinforcing Materials, and Forms (5 Hours) | (Module ID 68102-09) (27108-06 Core Curriculum Level One) |
| Handling and Placing Concrete (22.5 Hours) | (Module ID 68103-09) (27305-07 Core Curriculum Level Three) |
| Introduction to Masonry (20 Hours) | (Module ID 68104-09) (28101-04 Masonry Level One) |
| Masonry Units and Installation Techniques (60 Hours) | (Module ID 68105-09) (28105-04 Masonry Level One) |
| Floor Systems (25 Hours) | (Module ID 68106-09) (27105-06 Core Curriculum Level One) |
| Wall and Ceiling Framing (20 Hours) | (Module ID 68107-09) (27106-06 Core Curriculum Level One) |

**Product Supplements**

<table>
<thead>
<tr>
<th>Description</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerPoint® Presentation Slides</td>
<td>978-0-13-604845-9</td>
</tr>
<tr>
<td></td>
<td>$19</td>
</tr>
</tbody>
</table>

**Construction Materials and Methods**

- (12 Hours)
  - Trainee $19
  - Instructor $19
  (Module ID 45102-07) Provides 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.

**Thermal and Moisture Protection**

- (7.5 Hours)
  - Trainee $19
  - Instructor $19
  (Module ID 45103-07) Covers the selection and installation of insulating materials in walls, floors, and attics. Also covers the uses and installation practices for vapor barriers and waterproofing materials.

**Drywall Installation**

- (25 Hours)
  - Trainee $19
  - Instructor $19
  - ISBN 978-0-13-604853-4
  (Module ID 45104-07) Discusses types of gypsum drywall, their uses, and the fastening devices and methods used to install them. Discusses installing drywall on walls and ceilings using nails, drywall screws, and adhesives. Also covers fire- and sound-rated walls.
Drywall Level 1 (continued)

**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.

**Commercial Drawings** (25 Hours)
- **Trainee** $19
- **Instructor** $19

**Acoustical Ceilings** (20 Hours)
- **Trainee** $19
- **Instructor** $19

**Steel Framing** (50 Hours)
- **Trainee** $19
- **Instructor** $19

**Specialty Finishes** (15 Hours)
- **Trainee** $19
- **Instructor** $19

**Interior Specialties** (15 Hours)
- **Trainee** $19
- **Instructor** $19

**Exterior Cladding** (20 hours)
- **Trainee** $19
- **Instructor** $19

**Electrical Theory** (7.5 Hours)
- **Trainee** $19
- **Instructor** $19

**Device Boxes** (10 Hours)
- **Trainee** $19
- **Instructor** $19

**Hand Bending** (10 Hours)
- **Trainee** $19
- **Instructor** $19

**Orientation to the Electrical Trade** (2.5 Hours)
- **Trainee** $19
- **Instructor** $19

**Introduction to Electrical Circuits** (7.5 Hours)
- **Trainee** $19
- **Instructor** $19
Raceways and Fittings (20 Hours)
Instructor S9  ISBN 978-0-13-384209-8
(Module ID 26108-14) Introduces the types and applications of raceways, wireways, and ducts. Stresses the appropriate NEC® requirements.

Conductors and Cables (10 Hours)
Instructor S9  ISBN 978-0-13-384210-4
(Module ID 26109-14) Focuses on the types and applications of conductors and covers proper wiring techniques. Stresses the appropriate NEC® requirements.

Basic Electrical Construction Drawings (7.5 Hours)
Instructor S9  ISBN 978-0-13-384211-1
(Module ID 26110-14) Describes electrical prints, drawings, and symbols, and the types of information that can be found on schematics, one-lines, and wiring diagrams.

Residential Electrical Services (15 Hours)
(Module ID 26111-14) 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.

Electrical Test Equipment (5 Hours)
(Module ID 26112-14) Covers 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.

Ordering information for Electrical Level 1, 2011 NEC® update:

Curriculum Notes
- 145 Hours
- To Be Updated: Summer 2014 to reflect 2014 NEC® update
- Trainee Guide and individual trainee modules are full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccer.org.
- New robust PowerPoint available with Instructor Guide.

L2 ELECTRICAL

Pull and Junction Boxes (12.5 Hours)
(Module ID 26205-14) Explains how to select and size pull boxes, junction boxes, and handholes.

Conductor Installations (10 Hours)
Trainee S9  ISBN 978-0-13-384179-4
(Module ID 26206-14) Covers the transportation, storage, and setup of cable reels; methods of rigging; and procedures for complete cable pulls in raceways and cable trays.

Cable Tray (7.5 Hours)
(Module ID 26207-14) Focuses on NEC® installation requirements for cable tray, including cable installations.

Conductor Terminations and Splices (7.5 Hours)
(Module ID 26208-14) Describes methods of terminating and splicing conductors, including preparing and taping conductors.

Grounding and Bonding (15 Hours)
(Module ID 26209-14) Focuses on the purpose of grounding and bonding electrical systems. Thoroughly covers NEC® requirements.

Circuit Breakers and Fuses (12.5 Hours)
(Module ID 26210-14) Describes fuses and circuit breakers along with their practical applications. Also covers sizing.

Control Systems and Fundamental Concepts (12.5 Hours)
Trainee S9  ISBN 978-0-13-387889-4
(Module ID 26211-14) Gives basic descriptions of various types of contactors and relays along with their practical applications.

ORDERING INFORMATION FOR ELECTRICAL LEVEL 2, 2011 NEC® UPDATE:

NCCERconnect (See p. 7 for details)
For instructor access only, contact your Pearson Representative.

Conductor Installations
Trainee Guide Hardcover + Access Card Package: $121
IG Paperback + Access Card Package: $94
Access Card ONLY for Trainee Guide: $96
ELECTRONIC Access Code ONLY for Trainee Guide: $96 (does not include print book)

Conductor Terminations and Splices
Trainee Guide Hardcover + Access Card Package: $121
IG Paperback + Access Card Package: $94
Access Card ONLY for Trainee Guide: $96
ELECTRONIC Access Code ONLY for Trainee Guide: $96 (does not include print book)

Conduit Bending (15 Hours)
Trainee S9  ISBN 978-0-13-384183-1
Instructor S9  ISBN 978-0-13-387893-1
(Module ID 26204-14) Covers bends in conduit up to 6 inches. Focuses on mechanical, hydraulic, and electrical benders.

Splicing Conductors, Including Preparation and Taping
Trainee S9  ISBN 978-0-13-384186-0
Instructor S9  ISBN 978-0-13-387892-4
(Module ID 26203-14) Introduces principles of human vision and the characteristics of light. Focuses on the handling and installation of various types of lamps and lighting fixtures.

Conductor Terminations and Splices
Trainee Guide Hardcover + Access Card Package: $121
IG Paperback + Access Card Package: $94
Access Card ONLY for Trainee Guide: $96
ELECTRONIC Access Code ONLY for Trainee Guide: $96 (does not include print book)

Conductor Terminations and Splices
Trainee Guide Hardcover + Access Card Package: $121
IG Paperback + Access Card Package: $94
Access Card ONLY for Trainee Guide: $96
ELECTRONIC Access Code ONLY for Trainee Guide: $96 (does not include print book)
Distribution Equipment (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 26306-14) Discusses switchboards and switchgear, including installation, grounding, and maintenance requirements. This module includes blueprints.

Transformers (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 26307-14) Discusses transformer types, construction, connections, protection, and grounding.

Commercial Electrical Services (10 Hours)
Trainee $19
Instructor $19
(Module ID 26308-14) Covers the components, installation considerations, and NEC® requirements for commercial services.

Motor Calculations (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 26309-14) Covers calculations required to size conductors and overcurrent protection for motor applications.

Voice, Data, and Video (10 Hours)
Trainee $19
Instructor $19
(Module ID 26310-14) Covers installation, termination, and testing of voice, data, and video cabling systems.

Motor Controls (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 26311-14) Provides information on selecting, sizing, and installing motor controllers. Also covers control circuit pilot devices and basic relay logic.

Ordering information for Electrical Level 3, 2011 NEC® update.

PAPERBACK
Trainee Guide: $94
978-0-13-256995-2
Instructor’s Guide: $94
978-0-13-257121-0

PAPERBACK
Trainee Guide: $94
978-0-13-378938-6
Instructor Guide: $94
978-0-13-378925-6

Trainee Guide: $94
978-0-13-382315-8
Instructor Guide: $94
978-0-13-382333-2

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.

Motor Calculations
Trainee $19
Instructor $19
(Module ID 26309-14) Covers calculations required to size conductors and overcurrent protection for motor applications.

Voice, Data, and Video
Trainee $19
Instructor $19
(Module ID 26310-14) Covers installation, termination, and testing of voice, data, and video cabling systems.

Motor Controls
Trainee $19
Instructor $19
(Module ID 26311-14) Provides information on selecting, sizing, and installing motor controllers. Also covers control circuit pilot devices and basic relay logic.

Standby and Emergency Systems
Trainee $19
Instructor $19
(Module ID 26403-14) Explains the NEC® requirements for electric generators and storage batteries.

Basic Electronic Theory
Trainee $19
Instructor $19
(Module ID 26404-14) Explains the function and operation of basic electronic devices, including semiconductors, diodes, rectifiers, and transistors.

Fire Alarm Systems
Trainee $19
Instructor $19
(Module ID 26405-14) Covers fire alarm control units, Digital Alarm Communicator Systems (DACS), wiring for alarm initiating and notification devices, and alarm system maintenance.

Specialty Transformers
Trainee $19
Instructor $19
(Module ID 26406-14) Covers various types of transformers and their applications. Also provides information on selecting, sizing, and installing these devices.

Advanced Controls
Trainee $19
Instructor $19
(Module ID 26407-14) Discusses applications and operating principles of solid-state controls, reduced-voltage starters, and adjustable frequency drives. Also covers basic troubleshooting procedures.
Electrical Level 4 (continued)

HVAC Controls (15 Hours)
(Module ID 26408-14) Provides a basic overview of HVAC systems and their controls. Also covers electrical troubleshooting and NEC® requirements.

Heat Tracing and Freeze Protection (10 Hours)
(Module ID 26409-14) Covers heat tracing systems along with their applications and installation requirements.

Motor Operation and Maintenance (10 Hours)
(Module ID 26410-14) Covers motor cleaning, testing, and troubleshooting and NEC® requirements for medium-voltage terminations and splices.

Fundamentals of Crew Leadership (20 Hours)

Medium-Voltage Terminations/Splices (10 Hours)
(Module ID 26411-14) Offers an overview of the NEC® and cable manufacturers’ requirements for medium-voltage terminations and splices.

Ordering information for Electrical Level 4, 2011 NEC® update:

**PAPERBACK** ISBN
Instructor’s Guide: $94  978-0-13-257118-0

**NCCERconnect** (See p. 7 for details) ISBN
For instructor access only, contact your Pearson Representative.
ELECTRONIC Access Code ONLY for Trainee Guide: $96  (must be ordered electronically via OASIS; does not include print book)  978-0-13-292134-3

Advanced Electrical Topics
Much of the technology in emerging fields—such as wireless, integrated, and voice and data systems—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 program use the following compilation of modules drawn from EST and Instrumentation.

**BINDER**

Programs:
- **Cable Selection**
  - 33208-11 Programmable Logic Controllers
  - 12404-03 Broadband Systems
  - 33403-12 Distributed Control Systems
  - 12407-03 Intrusion Detection Systems
  - 33401-12 Audio Systems
  - 33401-12 Overview of Nurse Call
  - 33401-12 and Signalling Systems
  - 33409-12

- **Wire and Cable Terminations**
  - 33209-11

- **CCTV Systems**
  - 33410-12

- **Access Control Systems**
  - 33411-12

- **Buses and Networks**
  - 33301-11

- **Fiber Optics**
  - 33302-11

Managing Electrical Hazards
12.5 Hours Revised: 2012
Module ID 26501-12

**PAPERBACK** ISBN
Instructor’s Guide: $22  978-0-13-294917-0

**PowerPoint® Presentation Slides**

Electronic Systems Technician

**L1 ELECTRONIC SYSTEMS TECHNICIAN**
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 p. 10 for ordering information.)
- Revised: 2010, Third Edition
- Trainee Guide and individual trainee modules are full color.

**PAPERBACK** ISBN
Trainee Guide: $67  978-0-13-213790-6

**NCCERconnect** (See p. 7 for details) ISBN
For instructor access only, contact your Pearson Representative.
Access Card ONLY for Trainee Guide: $67  (does not include print book)  978-0-13-285970-7
ELECTRONIC Access Code ONLY for Trainee Guide: $67  (must be ordered electronically via OASIS; does not include print book)  978-0-13-292174-9

**Product Supplements**
- **PowerPoint® Presentation Slides**
  ISBN 978-0-13-213792-8 $40

**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.

**Introduction to the Trade** (2.5 Hours)
(Module ID 33101-10) Provides an overview of the alarm, telecommunications, and entertainment electronics industries. Introduces the elements of professional conduct and trainees’ responsibilities to themselves and their employers, customers, and fellow workers.
Electronic Systems Technician Level 1 (continued)

Wood and Masonry Construction Methods (12.5 Hours)
Trainee $19  
Instructor $19  
(Module ID 33102-10) Reviews the materials and techniques used in constructing and finishing residential and commercial buildings, including wood frame, brick and block, and post and beam. Covers common drills, bits, and techniques used to drill through wood and masonry. Also describes types of fasteners used with these materials.

Concrete and Steel Construction Methods (12.5 Hours)
Trainee $19  
Instructor $19  
(Module ID 33103-10) Describes the materials and techniques used in constructing and finishing residential and commercial buildings, including poured and prefabricated concrete and structural steel. Covers common drills, bits, and techniques used to drill through concrete and steel. Also describes types of fasteners used with these materials.

Pathways and Spaces (12.5 Hours)
Trainee $19  
Instructor $19  
(Module ID 33104-10) Introduces conduits and wireways used in low-voltage applications, along with their supporting hardware and fittings. Covers telecommunications cable pathways from the source to the destination, including maintenance holes, ducts, equipment rooms, and telecommunications closets.

Craft-Related Mathematics (12.5 Hours)
Trainee $19  
Instructor $19  
(Module ID 33105-10) Expands on Introduction to Construction Math with an emphasis on the metric system, including how to convert between English and metric units. Also covers the use of scientific notation, powers and roots, and the basic concepts of algebra, geometry, and right-angle trigonometry.

Low-Voltage Cabling (20 Hours)
Trainee $19  
Instructor $19  
(ISBN 978-0-13-213730-0)
(Module ID 33108-10) Covers the makeup, identification, and applications of conductors and cables used in telecommunications and security systems. Describes the tools, materials, and procedures for pulling cables through conduit and raceways.

L2 ELECTRONIC SYSTEMS TECHNICIAN

Semiconductors and Integrated Circuits (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 33204-10) Introduces the principles of electronics and semiconductor theory, components, and applications.

Test Equipment (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 33205-10) Covers the selection, inspection, use, and maintenance of basic test equipment used in low-voltage work. Also covers specialized test equipment such as signal generators, wattmeters, cable testers, and RF analyzers.

Introduction to Electrical Drawings (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 33206-10) Describes electrical prints, drawings, and symbols and the types of information that can be found on schematics, one-line drawings, and wiring diagrams.

Introduction to Codes and Standards (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 33207-10) 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®.

Cable Selection (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 33208-10) Provides an overview of the types of cable used for low-voltage installations. Also covers the methods used to select the proper size and type of cable for a typical installation.

Wire and Cable Terminations (25 Hours)
Trainee $19  
Instructor $19  
(Module ID 33209-10) Provides information and instructions for selecting, installing, and testing connectors and other terminating devices on cables used in low-voltage work, including telecommunications, video and audio, and fiber optics.

Power Quality and Grounding (20 Hours)
Trainee $19  
Instructor $19  
(Module ID 33210-10) 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.
**L3 ELECTRONIC SYSTEMS TECHNICIAN**

**Curriculum Notes**
- 152.5 Hours
- Revised: 2011, Third Edition
- Trainee Guide and individual trainee modules are full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

**PAPERBACK**
- ISBN

**NCCEConnect** (See p. 7 for details)
- ISBN
  - For instructor access only, contact your Pearson Representative.
  - IG Paperback + Access Card Package: $94 978-0-13-302971-0
  - ELECTRONIC Access Code ONLY for Trainee Guide: $94 (must be ordered electronically via OASIS; does not include print book) 978-0-13-302213-1

**Product Supplements**

**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.

**Buses and Networks (25 Hours)**
- Trainee S19 978-0-13-266375-5
- Instructor S19 978-0-13-266383-0
- (Module ID 33301-11) Details procedures for connecting computers and components, including network connections. Provides information on connecting controls and equipment in a control system, and explains how data is transferred between the nodes in a network.

**Fiber Optics (25 Hours)**
- Trainee S19 978-0-13-266376-2
- Instructor S19 978-0-13-266384-7
- (Module ID 33302-11) Introduces the types of equipment and methods used in fiber-optic cable installation.

**Wireless Communication (10 Hours)**
- Trainee S19 978-0-13-266377-9
- Instructor S19 978-0-13-266385-4
- (Module ID 33303-11) Introduces operating principles and equipment used in 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.

**Site Survey, Project Planning, and Documentation (15 Hours)**
- Trainee S19 978-0-13-266378-6
- Instructor S19 978-0-13-266386-1
- (Module ID 33304-11) Explains planning a job from start to finish, including how to perform site surveys for new and retrofit construction projects. Covers drawings, specifications, and other documents commonly used.

**Fundamentals of Crew Leadership (20 Hours)**
- Trainee S40 978-0-13-266379-3
- Instructor S40 978-0-13-266387-8
- (Module ID 46101-11) Details procedures for connecting electronic system enclosures, including power sequencing, grounding, weight distribution, and heat dissipation. Explains electrical power distribution and load calculations for equipment housed within racks.

**System Commissioning and User Training (20 Hours)**
- Trainee S19 978-0-13-266380-9
- Instructor S19 978-0-13-266389-2
- (Module ID 33305-11) 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.

**Maintenance and Repair (20 Hours)**
- Trainee S19 978-0-13-266382-3
- Instructor S19 978-0-13-266391-5
- (Module ID 33308-11) Introduces tasks involved in the maintenance and repair of low-voltage systems and equipment. Presents a systematic approach to system and component-level troubleshooting and methods of identifying common types of repairs.

**L4 ELECTRONIC SYSTEMS TECHNICIAN**

**Curriculum Notes**
- 325 Total Hours (175 Audio, Video, Voice & Data Training Path and 175 Life Safety & Security Training Path)
- Revised: 2012, Third Edition
- Trainee Guide and trainee modules are in full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.
- Modules 33401-12, 33402-12, 33403-12, and 33404-12 carry SBCA’s endorsement of training in support of their Satellite Fundamentals, Home Theater Fundamentals, and MDU/SMATV certifications.
- Module 33408-12 supports skills and knowledge statements used as the basis for NICET Fire Alarm Installer Certification Tests.

**PAPERBACK**
- ISBN

**NCCEConnect** (See p. 7 for details)
- ISBN
  - For instructor access only, contact your Pearson Representative.
  - Access Card ONLY for Trainee Guide: $94 (does not include print book) 978-0-13-299460-6
  - ELECTRONIC Access Code ONLY for Trainee Guide: $94 (must be ordered electronically via OASIS; does not include print book) 978-0-13-302215-5

**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.

**Audio Systems (30 Hours)**
- Trainee S19 978-0-13-292258-6
- Instructor S19 978-0-13-292267-8
- (Module ID 33401-12) 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.

**Video Systems (40 Hours)**
- Trainee S19 978-0-13-292257-9
- Instructor S19 978-0-13-292269-2
- (Module ID 33402-12) Describes the types of equipment used in various video systems and equipment, including both analog and digital video, video signaling, display devices, HDTV, 3-D video, and video processing and distribution.

**Broadband Systems (40 Hours)**
- Trainee S19 978-0-13-292258-6
- Instructor S19 978-0-13-292270-8
- (Module ID 33403-12) 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.

**Media Management Systems (20 Hours)**
- Trainee S19 978-0-13-292259-3
- Instructor S19 978-0-13-292271-5
- (Module ID 33404-12) 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.

**Telecommunications Systems (20 Hours)**
- Trainee S19 978-0-13-292260-9
- Instructor S19 978-0-13-292272-2
- (Module ID 33405-12) 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).
Electronic Systems Technician Level 4 (continued)

Fire Alarm Systems (40 Hours)

Trainee $19  Instructor $19

Instructor $19  ISBN 978-0-13-292263-0

(Module ID 33408-12) 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, emphasizing NEC® requirements.

Overview of Nurse Call and Signaling Systems (15 Hours)

Trainee $19  Instructor $19


(Module ID 33409-12) 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.

CCTV Systems (30 Hours)

Trainee $19  Instructor $19

Instructor $19  ISBN 978-0-13-292266-1

(Module ID 33411-12) Introduces access control systems, including applications, door locking systems, readers, biometrics, and controllers. Emphasizes installation practices as well as building and electrical codes.

Access Control Systems (35 Hours)

Trainee $19  Instructor $19


(Module ID 33412-12) Covers 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.

Intrusion Detection Systems (30 Hours)

Trainee $19  Instructor $19


(Module ID 33407-12) Describes devices such as sensors, notification, control panels, and programming used in intrusion detection security systems. Covers system design and installation guidelines, wiring, testing, and troubleshooting. Emphasizes codes and standards.

Heavy Equipment Operations

Heavy Equipment Safety (10 Hours)

Trainee $19  Instructor $19


(Module ID 22102-12) Provides a comprehensive overview of safety requirements on job sites with emphasis on OSHA, MSHA, and NIOSH requirements. Presents basic requirements for personal protection, safe equipment operations and maintenance, and HAZCOM.

Identification of Heavy Equipment (5 Hours)

Trainee $19  Instructor $19


(Module ID 22103-12) Introduces the eleven most used pieces of heavy equipment. Describes the functional operation and uses for each piece of equipment, along with a general description of heavy equipment drive and hydraulic systems.

Basic Operational Techniques (27.5 Hours)

Trainee $19  Instructor $19


(Module ID 22104-12) Covers prestart checks of a machine’s hardware (frame, body panels, tires or tracks, and safety equipment), driveline components, hydraulic system components, electrical components and controls. Reviews machine safety issues. Explains how to safely start, move, steer, stop, and shut down different types of machines.

Utility Tractors (17.5 Hours)

Trainee $19  Instructor $19


(Module ID 22105-12) Covers operation of general utility tractors in the construction industry. Describes duties and responsibilities of the operator, safety rules for operation, the attachment of implements, and basic preventive maintenance practices.

Introduction to Earthmoving (12.5 Hours)

Trainee $19  Instructor $19


(Module ID 22101-12) Provides a broad introduction to the process of planning and executing earth moving activities on various types of construction projects. The use of heavy equipment such as bulldozers, scrapers, excavators, and loaders is explained.

Grades, Part One (15 Hours)

Trainee $19  Instructor $19


(Module ID 22106-12) Introduces the concept of preparing graded surfaces using heavy equipment. Covers identification of construction stakes and interpretation of marks on each type of stake. Describes process for grading slopes.

Curriculum Notes

• 165 Total hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for completion and must be purchased separately. See p. 10 for ordering information.)
• Revised: 2012, Third Edition
• Trainee Guide and trainee modules are in full color.
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerconnect.com.

PAPERNACK  ISBN
Trainee Guide: $67  978-0-13-292142-8
Instructor’s Guide: $67  978-0-13-292166-4

NCCERconnect (See p. 7 for details)  ISBN
For instructor access only, contact your Pearson Representative.
Access Card ONLY for Trainee Guide: $67 (does not include print book)  978-0-13-302107-3
ELECTRONIC Access Code ONLY for Trainee Guide: $67 (must be ordered electronically via OASIS; does not include print book)  978-0-13-302236-0

Product Supplements

REVISED!

UTILITY EQUIPMENT OPERATIONS

L2

HEAVY EQUIPMENT OPERATIONS

LEVEL 2

Course Specifications

• 167.5 Hours
• Revised: 2013, Third Edition
• Trainee Guide and trainee modules are in full color.
• Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.

PAPERNACK  ISBN
Instructor’s Res. Access Card: $94  978-0-13-340383-1
### Site Work (20 Hours)

**Trainee S19**


(Module ID 22210-13) Expands an information covered in Level 1 in relation to setting and interpreting grade stakes. Also provides information and instructions on controlling surface water and ground water on a job site, as well as the layout of foundations and laying of pipe.

**Skid Steers (22.5 Hours)**

**Trainee S19**


ISBN 978-0-13-340337-4

(Module ID 22212-13) Describes the many uses of skid steers and the attachments available for these machines. Covers safety practices, as well as inspection, startup, shutdown, and operation of skid steers.

### Soils (10 Hours)

**Trainee S19**


(Module ID 22208-13) Describes soil classification systems and explains how shrink and swell factors affect equipment selection. Discusses how soil conditions affect equipment performance and explains techniques for working with various types of soils.

## LEVEL 3

### HEAVY EQUIPMENT OPERATIONS

- 170 Hours
- To Be Revised: Spring 2014, Third Edition
- Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.

**PAPERBACK**


Instructor’s Guide: $94


Instructor's Guide: $94

**ELECTRONIC**

Access Card ONLY for Trainee Guide: $96

Access Card ONLY for Trainee Guide: $96

Instructor’s Resource Access Card: $94

Instructor’s Resource Access Card: $94

**NEW!**

### Compenation Equipment (15 Hours)

**Trainee S19**


(Module ID 22203-14) Provides training on common types of compaction equipment; the primary instruments, controls, and attachments of a roller; safety guidelines associated with compaction equipment; and prestart inspections, preventive maintenance, and proper operating procedures. Factors involved in work activities associated with a roller are also presented.

### Backhoes (20 Hours)

**Trainee S19**


(Module ID 22203-14) Identifies and describes the common uses, types, components, instruments, controls, and attachments of backhoes. Safety guidelines, prestart inspection procedures, and preventive maintenance requirements are presented. Basic startup and operation are described, and common work activities associated with backhoes are covered.

### Dozers (30 Hours)

**Trainee S19**

ISBN 978-0-13-382759-0


(Module ID 22230-14) Identifies and describes the common uses, types, and components of dozers. Safety guidelines, prestart inspection procedures, and preventive maintenance requirements are presented. Basic startup, driving maneuvers, loading, and dumping procedures for off-road dump trucks are covered.

### Off-Road Dump Trucks (15 Hours)

**Trainee S19**


(Module ID 22230-14) Identifies and describes the common uses, types, and components of off-road dump trucks. Safety guidelines, prestart inspection procedures, and preventive maintenance requirements are presented. Basic startup and operation are described, and common work activities associated with dozers are covered.

### Excavators (40 Hours)

**Trainee S19**


(Module ID 22230-14) Identifies and describes the common uses, types, and components of excavators. Safety guidelines, prestart inspection procedures, and preventive maintenance requirements are presented. Basic startup and operation are described, and common work activities associated with excavators are covered.

### Motor Graders (40 Hours)

**Trainee S19**


(Module ID 22230-13) Identifies and describes the common uses and types of motor graders. Safety guidelines, prestart inspection procedures, and preventive maintenance requirements are presented. Basic startup and operation are described, and common work activities associated with motor graders are covered.

### Ordering Information for Heavy Equipment Operations Level 3, Second Edition:

**PAPERBACK**


Trainee’s Guide: $94


Instructor’s Guide: $94
Highway / Heavy Construction

Heavy Equipment (15 Hours)
Trainee $19  Instructor $19
(Module ID 36103-01) 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.

Cranes (7.5 Hours)
Trainee $19  Instructor $19
(Module ID 36104-01) Introduces 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.

Below-Grade Construction (12.5 Hours)
Trainee $19  Instructor $19
(Module ID 36105-01) Discusses the below-grade construction processes, including excavation support systems, excavation safety, underground piping materials and fittings, joining methods for underground pipe, box culverts, and catch basins.

Earthmoving (12.5 Hours)
Trainee $19  Instructor $19
(Module ID 36106-01) Discusses ground preparation procedures for highway/heavy construction. Explains soil basics, including terminology, identification, classification, and methods of stabilizing soils. Addresses earthmoving operations, such as laying out slopes and grades, site excavation, and hauling.

Plant Operations (7.5 Hours)
Trainee $19  Instructor $19
(Module ID 36107-01) 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.

Paving (2.5 Hours)
Trainee $19  Instructor $19
(Module ID 36108-01) Explains how to perform hot mix asphalt paving and concrete paving. Describes asphalt pavers and equipment required to perform paving. Discusses concrete paving equipment such as concrete pavers, slip-form pavers, and texture/cutting machines.

Structures (12.5 Hours)
Trainee $19  Instructor $19
(Module ID 36109-01) 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.

HVAC

L1 HVAC

Curriculum Notes
- 192.5 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
- Revised: 2013, Fourth Edition
- Trainee Guide and individual trainee modules are full color.
- NATE Recognized Training Provider

HVAC (7.5 Hours)
Trainee $19  Instructor $19
(Module ID 03101-13) Covers the basic principles of heating, ventilating, and air conditioning, career opportunities in HVAC, and how apprenticeship programs are conducted. Basic safety principles, as well as trade licensure and EPA guidelines, are also introduced.

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.

Introduction to HVAC (7.5 Hours)

Product Supplements
PowerPoint® Presentation Slides
$25

Includes the newest waterjet safety technologies, methods, and equipment. Also provides expanded information on shrouds, shielding, checking, and grounding.

Hydroblasting

Hydroblasting (12.5 Hours)
(Module ID 43101-12) Revised: 2012, Second Edition

PAPERBACK  ISBN
978-0-13-064886-0  978-0-13-064887-7

Product Supplements
PowerPoint® Presentation Slides
ISBN 978-0-13-340395-4
$25

Includes the newest waterjet safety technologies, methods, and equipment. Also provides expanded information on shrouds, shielding, checking, and grounding.

Highway / Heavy Construction

Suggested Materials
- Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.

PAPERBACK  ISBN
978-0-13-340253-7  978-0-13-340382-4

NCCECconnect (See p. 7 for details)  ISBN
For instructor access only, contact your Pearson Representative.
978-0-13-340934-5
Access Card ONLY for Trainee Guide: $67
(Does not include print book)
978-0-13-34095-4
(Must be ordered electronically via OASIS; does not include print book)
978-0-13-34044-0

Stay Connected:
Facebook  Twitter  www.nccer.org/bookstore

To Order Call: 1-800-922-0579
Trade Mathematics (10 Hours)
(Module ID 03102-13) Explains how to solve HVAC/R trade-related problems involving the measurement of lines, area, volume, weights, angles, pressure, vacuum, and temperature. Also includes a review of scientific notation, powers, roots, and basic algebra and geometry.

Basic Electricity (12.5 Hours)
Instructor $19  ISBN 978-0-13-340351-0
(Module ID 03106-13) Introduces the concept of power generation and distribution, common electrical components, AC and DC circuits, and electrical safety as it relates to the HVAC field. Introduces reading and interpreting wiring diagrams.

Introduction to Heating (15 Hours)
(Module ID 03108-13) Covers the fundamentals of heating systems and the combustion process. The different types and designs of gas furnaces and their components, as well as basic procedures for their installation and service, is provided.

Introduction to Cooling (30 Hours)
Instructor $19  ISBN 978-0-13-340353-4
(Module ID 03107-13) Explains the fundamental operating concepts of the refrigeration cycle and identifies both primary and secondary components found in typical HVAC/R systems. Common refrigerants are introduced as well. Describes the principles of heat transfer and the essential pressure-temperature relationships of refrigerants. Basic control concepts for simple systems are also introduced.

Introduction to Air Distribution Systems (15 Hours)
(Module ID 03109-13) Describes the factors related to air movement and its measurement in common air distribution systems. The required mechanical equipment and materials used to create air distribution systems are also presented. Basic system design principles for both hot and cold climates are introduced.

Basic Copper and Plastic Piping Practices (10 Hours)
(Module ID 03103-13) Explains how to identify types of copper tubing and fittings used in the HVAC/R industry and how they are mechanically joined. The identification and application of various types of plastic piping, along with their common assembly and installation practices, are also presented.

Soldering and Brazing (10 Hours)
(Module ID 03104-13) Introduces the equipment, techniques, and materials used to solder and braze. The required PPE, preparation, and work processes are covered in detail. The procedures for brazing copper to dissimilar materials are also provided.

Basic Carbon Steel Piping Practices (10 Hours)
(Module ID 03105-13) Explains how to identify various carbon steel piping materials and fittings. The joining and installation of threaded and grooved carbon steel piping systems is covered, with detailed coverage of threading and grooving techniques included.

Curriculum Notes


NCCERconnect (See p. 7 for details)

For instructor access only, contact your Pearson Representative.

Trainee Guide Paperback
+ Access Card Package: $119
ISBN TBD

ACCESS CARD ONLY for Trainee Guide: $94
ISBN TBD

Trainee Guide and individual trainee modules are full color.

Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.

PAPERBACK
Instructor’s Res. Access Card: $94

HVAC (LEVEL 2)

Leak Detection, Evacuation, Recovery, and Charging (30 Hours)
(Module ID 03205-13) Covers servicing of the refrigerant circuit of HVAC systems. The four essential service tasks—leak detection, evacuation, recovery, and charging—are covered in detail in addition to EPA’s requirements for providing these services.

Metering Devices (7.5 Hours)
(Module ID 03303-13) Introduces metering devices used in the mechanical refrigeration cycle. Covers their primary function along with related components. Operation of capillary tube, fixed-orifice, and expansion-type metering devices is explored in addition to selecting and installing thermal expansion valves.

Heat Pumps (20 Hours)
Instructor $19  ISBN 978-0-13-378013-0
(Module ID 03211-13) Presents the operation of heat pump systems in detail with additional emphasis on electric resistance heating elements. Covers installation considerations of both split and packaged heat pump systems.

Basic Maintenance (10 Hours)
(Module ID 03215-13) Describes common tasks associated with basic maintenance. Specific tasks, such as lubrication and belt installation, are reviewed in detail. Provides detailed coverage on maintenance inspections of gas furnaces and common cooling/heat pump systems.

Chimneys, Vents, and Flues (5 Hours)
Instructor $19  ISBN 978-0-13-382270-0
(Module ID 03202-13) Covers the chimneys, vents, and flues that are used with fuel-burning furnaces and boilers.

Sheet Metal Duct Systems (10 Hours)
(Module ID 03213-13) Covers the layout, fabrication, installation, and insulation of sheet metal duct systems. Also includes selection of registers, diffusers, dampers, and other duct accessories.
HVAC Level 2 (continued)

Fiberglass and Fabric Duct Systems (7.5 Hours)
Instructor $19  ISBN 978-0-13-382272-4
(Module ID 03214-13) Reviews the application and methods of fabricating fiberglass duct systems. Installation guidelines and methods to repair damaged components. Concludes with fabric-based duct systems.

Commercial Airside Systems (12.5 Hours)
(Module ID 03201-13) Introduces systems used in commercial structures such as schools and office buildings that are divided into comfort heating and cooling zones. Covers the various types of systems, as well as the air terminals and air source equipment used. Commonly used accessories are also covered.

Air Quality Equipment (5 Hours)
(Module ID 03204-13) Introduces the factors related to indoor air quality and human comfort. Equipment used to control humidity is presented in detail. Also covers air filtration materials and the introduction of outside air into the indoor environment.

Introduction to Hydronic Systems (12.5 Hours)
(Module ID 03203-13) Introduces hydronic heating systems, the fuels used to heat the water and the pumps that circulate the heated water.

Fasteners, Hardware, and Wiring Terminations (10 Hours)
(Module ID 03313-13) Covers a variety of fasteners, hardware, and wiring terminations used in HVAC systems including the installation of these components.

Control Circuit and Motor Troubleshooting (30 Hours)
(Module ID 03314-13) Provides information and skills to troubleshoot control circuits and electric motors found in heating and cooling equipment.

Troubleshooting Cooling (20 Hours)
(Module ID 03210-13) Provides guidance related to troubleshooting cooling systems.

Troubleshooting Heat Pumps (12.5 Hours)
(Module ID 03311-13) Provides a thorough review of heat pump systems, operating cycle and troubleshooting procedures for components.

Troubleshooting Gas Heating (12.5 Hours)
(Module ID 03209-13) Covers information and skills needed to troubleshoot gas-fired furnaces and boilers.

Troubleshooting Oil Heating (12.5 Hours)
(Module ID 03310-13) Describes the construction and operation of oil-fired heating systems and their components. Includes servicing and testing of oil furnaces and procedures for isolating and correcting oil furnace malfunctions.

Troubleshooting Accessories (7.5 Hours)
(Module ID 03312-13) Delivers information and skills needed to troubleshoot various air treatment accessories used with heating and cooling equipment.

Zoning, Ductless, and Variable Refrigerant Flow Systems (12.5 Hours)
(Module ID 03315-13) Introduces the information and skills needed to troubleshoot and repair zoned, ductless, and variable refrigerant flow systems.

Commercial Hydronic Systems (10 Hours)
Instructor $19  ISBN 978-0-13-378138-0
(Module ID 03305-13) Reviews basic properties of water and describes how water pressure is related to the movement of water through piping systems. Describes various types and components of commercial hot-water heating and chilled-water cooling systems, and examines how these systems function.

Steam Systems (10 Hours)
(Module ID 03306-13) Focuses on the use of steam for storing and moving energy in HVAC systems. Reviews the fundamentals of water that relate to steam and describes the basic steam system cycle. Discusses a steam system’s operational components—steam boilers and their accessories and controls; steam system loads, including heat exchangers/converters and terminal devices. Steam system valves and piping are covered in detail, including common types of piping arrangements, the components of a condensate return/ feedwater system, steam and condensate pipe sizing; and pressure-reducing valves and thermostatic valves.

Retail Refrigeration System (15 Hours)
(Module ID 03304-13) Covers the applications, principles, and troubleshooting of retail refrigeration systems.

Customer Relations (5 Hours)
(Module ID 03316-13) Presents the importance of establishing good relations with customers and provides guidance on how to achieve that goal. Focuses on ways for a technician to make a good first impression and describes how to communicate in a positive manner with customers. The elements of a service call and dealing with different types of problem customers are also covered.

Steam Systems (10 Hours)
(Module ID 03306-13) Focuses on the use of steam for storing and moving energy in HVAC systems. Reviews the fundamentals of water that relate to steam and describes the basic steam system cycle. Discusses a steam system’s operational components—steam boilers and their accessories and controls; steam system loads, including heat exchangers/converters and terminal devices. Steam system valves and piping are covered in detail, including common types of piping arrangements, the components of a condensate return/ feedwater system, steam and condensate pipe sizing; and pressure-reducing valves and thermostatic valves.

Retail Refrigeration System (15 Hours)
(Module ID 03304-13) Covers the applications, principles, and troubleshooting of retail refrigeration systems.

Customer Relations (5 Hours)
(Module ID 03316-13) Presents the importance of establishing good relations with customers and provides guidance on how to achieve that goal. Focuses on ways for a technician to make a good first impression and describes how to communicate in a positive manner with customers. The elements of a service call and dealing with different types of problem customers are also covered.

L3 HVAC

Curriculum Notes

• 157.5 Hours
• Revised: 2013, Fourth Edition
• NATE-Recognized Training Provider
• Trainee Guide and individual trainee modules are full color.
• Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.

Trainee Guide: $94

NCERConnect (See p. 7 for details) \NEW!
For instructor access only, contact your Pearson Representative.
Trainee Guide Paperback
+ Access Card Package: $119
Access Card ONLY for Trainee Guide: $94 (does not include print book)
Access Code for Trainee Guide: $94 (must be ordered electronically via OASIS; does not include print book)

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.
HVAC Level 4 (continued)

Water Treatment (12.5 Hours)
Trainee $19
Instructor $19
ISBN 978-0-13-378143-4
(Module ID 03308-13) Explains water problems encountered in heating and cooling systems and identifies water treatment methods and equipment. Covers basic water testing procedures and chemistry.

Indoor Air Quality (10 Hours)
Trainee $19
Instructor $19
(Module ID 03403-13) Defines the issues associated with indoor air quality and its effect on the health and comfort of building occupants. Provides guidelines for performing an IAQ survey and covers the equipment and methods used to monitor and control indoor air quality.

Energy Conservation Equipment (7.5 Hours)
Trainee $19
Instructor $19
ISBN 978-0-13-378173-1
(Module ID 03404-13) Covers heat recovery/reclaim devices, as well as other energy recovery equipment used to reduce energy consumption in HVAC systems.

Building Management Systems (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 03405-13) Explains how computers and microprocessors are used to manage zoned HVAC systems. Provides coverage of various network protocols and systems controllers, and introduces trainees to the various means of connection and system interface.

System Air Balancing (15 Hours)
Trainee $19
Instructor $19
(Module ID 03402-13) Covers air properties and gas laws, as well as the use of psychrometric charts. Describes the tools, instruments, and procedures used to balance an air distribution system.

System Startup and Shutdown (15 Hours)
Trainee $19
Instructor $19
(Module ID 03406-13) Presents the procedures for the startup and shutdown of hot water, steam heating, chilled water, and air handling systems. Also covers the startup and shutdown of typical cooling towers and packaged HVAC units. The procedures for both short- and long-term shutdowns are included.

Construction Drawings and Specifications (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 03401-13) Teaches how to interpret drawings used in commercial construction, including mechanical drawings, specifications, shop drawings, and as-builts. Explains how to perform takeoff procedures for equipment, fittings, ductwork, and other components.

Heating and Cooling System Design (25 Hours)
Trainee $19
Instructor $19
(Module ID 03407-13) Identifies factors that affect heating and cooling loads. Explains the process by which heating and cooling loads are calculated, and how load calculations are used in the selection of heating and cooling equipment. Covers basic types of duct systems and their selection, sizing, and installation requirements.

Commercial and Industrial Refrigeration Systems (20 Hours)
Trainee $19
Instructor $19
(Module ID 03408-13) Expands on the study of product and process refrigeration equipment by describing systems used in cold storage and food processing applications, as well as transportation refrigeration. Various types of defrost systems are covered in detail.

Alternative and Specialized Heating and Cooling Systems (10 Hours)
Trainee $19
Instructor $19
(Module ID 03409-13) Describes alternative devices used to reduce energy consumption, including wood, coal, and pellet-fired systems, waste-oil heaters, geothermal heat pumps, solar heating, in-floor radiant heating, and direct-fired makeup units. Also introduces application-specific computer room environmental and air turnover systems.

Fundamentals of Crew Leadership (20 Hours)
Trainee $40
Instructor $40
(Module ID 46101-11)

Indoor Air Quality (5 Hours)
Trainee $19
Instructor $19
(Module ID 03403-09)

Air Quality Equipment (20 Hours)
Trainee $19
Instructor $19
(Module ID 03401-13)

System Air Balancing (15 Hours)
Trainee $19
Instructor $19
(Module ID 03402-13)

Alternative and Specialized Heating and Cooling Systems (15 Hours)
Trainee $19
Instructor $19
(Module ID 03409-13)

To Order Call: 1-800-922-0579 www.nccer.org/bookstore
Industrial Coating and Lining Application Specialist Level 1 (continued)

Introduction to the Trade (5 Hours)
(Module ID 69101-09) Provides an introduction to the coatings industry, including career opportunities and an introduction to coatings safety.

Surface Preparation One (100 Hours)
Instructor $19  ISBN 978-0-13-604824-4
(Module ID 69102-09) Explains reasons for surface preparation, standards of preparation, and methods of preparing surfaces. Describes the use of basic equipment as well as cleaning procedures.

Industrial Coating One (15 Hours)
Instructor $19  ISBN 978-0-13-604825-1
(Module ID 69103-09) Describes types of coatings, their advantages and disadvantages, applications, and specific preparations required.

Coating Application One (105 Hours)
Instructor $19  ISBN 978-0-13-604826-8
(Module ID 69104-09) Covers the application of various coatings, including equipment setup, mixing, and preparation of coatings.

Health and Safety, Debris Management, Containment, and Ventilation (47.5 Hours)
(Module ID 69105-09) Teaches proper health and safety procedures for operators applying coatings in an industrial workplace. The use of personal protection equipment, debris management, and proper containment and ventilation procedures are discussed.

Industrial Maintenance Electrical & Instrumentation Technician

L1 INDUSTRIAL MAINTENANCE ELECTRICAL & INSTRUMENTATION TECHNICIAN

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 p. 10 for ordering information.)
• Revised: 2007, Third Edition
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK  ISBN
Trainee Guide: $67  978-0-13-228606-0
Instructor’s Guide: $67  978-0-13-228607-7

L2 INDUSTRIAL COATING AND LINING APPLICATION SPECIALIST

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.

Surface Preparation One (100 Hours)  ISBN 978-0-13-604818-3
Instructor $19
Trainee $19

Coating Application One (105 Hours)  ISBN 978-0-13-604821-3
Instructor $19
Trainee $19

Health and Safety, Debris Management, Containment, and Ventilation (47.5 Hours)  ISBN 978-0-13-604817-6
Instructor $19
Trainee $19

Industrial Coating One (15 Hours)  ISBN 978-0-13-604820-6
Instructor $19
Trainee $19

Coating Application One (105 Hours)  ISBN 978-0-13-604821-3
Instructor $19
Trainee $19

Health and Safety, Debris Management, Containment, and Ventilation (47.5 Hours)  ISBN 978-0-13-604817-6
Instructor $19
Trainee $19

Instructor $19
Trainee $19

Instructor $19
Trainee $19

Fasteners and Anchors (5 Hours)  ISBN 978-0-13-614614-8
Instructor $19
Trainee $19

Oxyfuel Cutting (17.5 Hours)  ISBN 978-0-13-614615-5
Instructor $19
Trainee $19

Instructor $19
Trainee $19

Instructor $19
Trainee $19

Containment (60 Hours)  ISBN 978-0-13-604795-7
Instructor $19
Trainee $19

Surface Preparation Two (80 Hours)  ISBN 978-0-13-604798-8
Instructor $19
Trainee $19

Coating Applications Two (100 Hours)  ISBN 978-0-13-604799-5
Instructor $19
Trainee $19

Curriculum Notes
• 320 Hours
• Published: 2010

PAPERBACK  ISBN
Trainee Guide: $100  978-0-13-604510-6
Instructor’s Guide: $100  978-0-13-604511-3

Product Supplements
$40

To Order Call: 1-800-922-0579  Stay Connected:  www.nccer.org/bookstore

Industrial Coatings One (5 Hours)
(Module ID 69203-10) Explains how to follow and execute a work plan. Covers area and ratio calculations and explains how to determine VOC ratios when adding thinners. Explains the effects of pressure, volume, and temperature on surface preparation and application.

Instructor $19
Trainee $19

Surface Preparation Two (80 Hours)  ISBN 978-0-13-604798-8
Instructor $19
Trainee $19

Coating Applications Two (100 Hours)  ISBN 978-0-13-604799-5
Instructor $19
Trainee $19

Oxyfuel Cutting (17.5 Hours)  ISBN 978-0-13-614628-5
Instructor $19
Trainee $19

Instructor $19
Trainee $19

Fasteners and Anchors (5 Hours)  ISBN 978-0-13-614627-8
Instructor $19
Trainee $19

Oxyfuel Cutting (17.5 Hours)  ISBN 978-0-13-614628-5
Instructor $19
Trainee $19

Instructor $19
Trainee $19

To use wet and dry film thickness gauges.
Craft-Related Mathematics (15 Hours)
Instructor S19  ISBN 978-0-13-614597-4
(Module ID 40106-07) Explains how to use ratios and proportions, solve basic algebra, area, volume, and circumference problems, and solve for right triangles using the Pythagorean theorem.

Construction Drawings (12.5 Hours)
(Module ID 40107-07) Introduces plot plans, structural drawings, elevation drawings, as-built drawings, equipment arrangement drawings, P&IDs, isometric drawings, basic circuit diagrams, and detail sheets.

Pumps and Drivers (5 Hours)
(Module ID 40108-07) Explains centrifugal, rotary, reciprocating, metering, and vacuum pump operation and installation methods, as well as types of drivers. Describes net positive suction head and cavitation.

Valves (5 Hours)
(Module ID 40109-07) Identifies different types of valves and describes their installation, storage, and handling.

Introduction to Test Instruments (7.5 Hours)
(Module ID 40110-07) Introduces test equipment for industrial maintenance, including tachometers, pyrometers, strobe meters, voltage testers, and automated diagnostic tools.

Material Handling and Hand Rigging (15 Hours)
(Module ID 40111-07) Introduces the equipment and techniques of material handling, and describes the procedures for rigging and communicating with riggers.

Mobile and Support Equipment (10 Hours)
(Module ID 40112-07) Introduces the safety procedures and methods of operation for motorized support equipment, including forklifts, manlifts, compressors, and generators.

Lubrication (12.5 Hours)
(Module ID 40113-07) Explains lubrication safety, storage, and classifications. Also explains selecting lubricants, additives, lubrication equipment, and lubricating charts.

**INDUSTRIAL MAINTENANCE ELECTRICAL & INSTRUMENTATION TECHNICIAN**

**LEVEL 2**

**Curriculum Notes**
- 160 Hours
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

**PAPERBACK**

**Product Supplements**

**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.

**Industrial Safety for E & I Technicians** (12.5 Hours)
(Module ID 40201-08) Introduces electrical concepts used for testing AC circuits and components.

**Introduction to the National Electrical Code** (15 Hours)
(Module ID 40208-08) Introduces the types and applications of AC circuits. Covers resistive circuits, Kirchhoff’s voltage and current laws, and circuit analysis.

**Alternating Current** (20 Hours)
(Module ID 40204-08) Focuses on the topics and applications of conductors and electrical cabling and covers proper wiring techniques. Stresses the applicable NEC® requirements.
Transformer Applications (7.5 Hours)
Trainee S19  
Instructor S19  
(Module ID 40306-09) Discusses transformer types, construction, connections, protection, and grounding along with capacitors and rectifiers.

Conductor Selection and Calculations (15 Hours)
Trainee S19  
Instructor S19  
(Module ID 40307-09) Covers the types of conductors used in wiring systems, including insulation, current-carrying capacity, and temperature ratings.

Temporary Grounding (15 Hours)
Trainee S19  
Instructor S19  
(ISBN 978-0-13-604738-4  
(Module ID 40308-09) Covers methods used to eliminate or reduce electrical shock hazards to personnel working on electrical equipment.

Layout and Installation of Tubing and Piping Systems (22.5 Hours)
Trainee S19  
Instructor S19  
(Module ID 40309-09) Introduces piping and tubing layout procedures. Explains the steps in creating a hand-drawn 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.

Machine Bending of Conduit (15 Hours)
Trainee S19  
Instructor S19  
(Module ID 40310-09) Covers bends in conduit up to six inches. Focuses on mechanical, hydraulic, and electrical benders.

Hydraulic Controls (15 Hours)
Trainee S19  
Instructor S19  
(Module ID 40311-09) Introduces hydraulic principles and fluids, system devices functions and controls of system devices, hydraulic symbols and drawings. Covers safety considerations for hydraulic systems, as well as troubleshooting.

Pneumatic Controls (15 Hours)
Trainee S19  
Instructor S19  
(ISBN 978-0-13-604739-1  
(Module ID 40312-09) Describes principles of atmospheric and compressed air gases, and how compressors transmit and treat compressed (pneumatic) air. Covers pneumatic system symbols, drawings and system safety. Addresses the functions and control of pneumatic system components and provides guidelines for troubleshooting.

Motor-Operated Valves (15 Hours)
Trainee S19  
Instructor S19  
(Module ID 40313-09) Covers motor-driven valves, ranging from small, servo-mechanical actuators to large valves that could only be operated by several people if they were not motor driven. Includes electrical, pneumatic, and hydraulic operators.

L3 INDUSTRIAL MAINTENANCE ELECTRICAL & INSTRUMENTATION TECHNICIAN

MODULES

Conductor Terminations and Splices (10 Hours)
Trainee S19  
Instructor S19  
(Module ID 40213-08) Describes methods of terminating and splicing conductors of all types and sizes, including preparing and taping conductors.

Transformer Applications (7.5 Hours)
Trainee S19  
Instructor S19  
(Module ID 40306-09) Discusses transformer types, construction, connections, protection, and grounding along with capacitors and rectifiers.

Conductor Selection and Calculations (15 Hours)
Trainee S19  
Instructor S19  
(Module ID 40307-09) Covers the types of conductors used in wiring systems, including insulation, current-carrying capacity, and temperature ratings.

Temporary Grounding (15 Hours)
Trainee S19  
Instructor S19  
(ISBN 978-0-13-604738-4  
(Module ID 40308-09) Covers methods used to eliminate or reduce electrical shock hazards to personnel working on electrical equipment.

Layout and Installation of Tubing and Piping Systems (22.5 Hours)
Trainee S19  
Instructor S19  
(Module ID 40309-09) Introduces piping and tubing layout procedures. Explains the steps in creating a hand-drawn 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.

Machine Bending of Conduit (15 Hours)
Trainee S19  
Instructor S19  
(Module ID 40310-09) Covers bends in conduit up to six inches. Focuses on mechanical, hydraulic, and electrical benders.

Hydraulic Controls (15 Hours)
Trainee S19  
Instructor S19  
(Module ID 40311-09) Introduces hydraulic principles and fluids, system devices functions and controls of system devices, hydraulic symbols and drawings. Covers safety considerations for hydraulic systems, as well as troubleshooting.

Pneumatic Controls (15 Hours)
Trainee S19  
Instructor S19  
(ISBN 978-0-13-604739-1  
(Module ID 40312-09) Describes principles of atmospheric and compressed air gases, and how compressors transmit and treat compressed (pneumatic) air. Covers pneumatic system symbols, drawings and system safety. Addresses the functions and control of pneumatic system components and provides guidelines for troubleshooting.

Motor-Operated Valves (15 Hours)
Trainee S19  
Instructor S19  
(Module ID 40313-09) Covers motor-driven valves, ranging from small, servo-mechanical actuators to large valves that could only be operated by several people if they were not motor driven. Includes electrical, pneumatic, and hydraulic operators.

To Order Call: 1-800-922-0579 Stay Connected: www.nccer.org/bookstore
### Industrial Maintenance Mechanic

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Hours</th>
<th>ISBN Code</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tools of the Trade</strong> (5 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32102-07) Introduces hand and power tools used in industrial maintenance. Covers safety procedures and proper use of these tools.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fasteners and Anchors</strong> (5 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32103-07) Covers the hardware and systems used in industrial maintenance. Describes anchors and supports, their applications, and how to install them safely.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oxyfuel Cutting</strong> (17.5 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32104-07) Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and provides instructions for setting up, lighting, and using the equipment. Explains how to perform straight line cutting, piercing, beveling, washing, and gouging.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gaskets and Packing</strong> (10 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32105-07) Introduces gaskets and gasket material, packing and packing material, and types of O-ring material. Explains the use of gaskets, packing, and O-rings, and how to fabricate a gasket.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Craft-Related Mathematics</strong> (15 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructor $19</td>
<td>ISBN 978-0-13-614568-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32106-07) Explains how to use ratios and proportions, solve basic algebra, area, volume, and circumference problems, and solve for right triangles using the Pythagorean theorem.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Construction Drawings</strong> (12.5 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32107-07) Introduces plot plans, structural drawings, elevation drawings, as-built drawings, equipment arrangement drawings, P&amp;IDs, isometric drawings, basic circuit diagrams, and detail sheets.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pumps and Drivers</strong> (5 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32108-07) Explains centrifugal, rotary, reciprocating, metering, and vacuum pump operation and installation methods, as well as types of drivers. Describes net positive suction head and cavitation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Valves</strong> (5 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32109-07) Identifies different types of valves and describes their installation as well as valve storage and handling.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Introduction to Test Instruments</strong> (7.5 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructor $19</td>
<td>ISBN 978-0-13-614607-0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32110-07) Introduces test equipment for industrial maintenance, including tachometers, pyrometers, strobe meters, voltage testers, and automated diagnostic tools.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Material Handling and Hand Rigging</strong> (15 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32111-07) Introduces the equipment and techniques of material handling, and describes the procedures for rigging and communicating with riggers.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mobile and Support Equipment</strong> (10 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructor $19</td>
<td>ISBN 978-0-13-614609-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32112-07) Introduces the safety procedures and methods of operation for motorized support equipment, including forklifts, personnel lifts, compressors, and generators.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lubrication</strong> (12.5 Hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Module ID 32113-07) Explains lubrication safety, storage, and classifications. Also explains selecting lubricants, additives, lubrication equipment, and lubricating charts.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Trainee Guide: $67**

**Instructor’s Guide: $67**

**PAPERBACK**

Trainee Guide: 978-0-13-228608-4

Instructor’s Guide: 978-0-13-228609-1

**PowerPoint® Presentation Slides**


$40
## Industrial Maintenance Mechanic Level 2

### Curriculum Notes
- 160 Hours
- Revised: 2007, Third Edition
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

#### 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.

<table>
<thead>
<tr>
<th>Module</th>
<th>Type</th>
<th>ISBN</th>
<th>Trainee Price</th>
<th>Instructor Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Bearings (15 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604627-1</td>
<td>$19</td>
<td>$29</td>
</tr>
<tr>
<td>Low-Pressure Steam Systems (10 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604628-8</td>
<td>$19</td>
<td>$29</td>
</tr>
<tr>
<td>High-Pressure Steam Systems and Auxiliaries (20 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604666-6</td>
<td>$19</td>
<td>$29</td>
</tr>
<tr>
<td>Distillation Towers and Vessels (20 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604665-3</td>
<td>$19</td>
<td>$29</td>
</tr>
<tr>
<td>Heaters, Furnaces, Heat Exchangers, Cooling Towers, and Fin Fans (30 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604666-0</td>
<td>$19</td>
<td>$29</td>
</tr>
<tr>
<td>Advanced Trade Math (30 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604681-3</td>
<td>$19</td>
<td>$29</td>
</tr>
</tbody>
</table>

### Introduction to Bearings
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32207-07)** Introduces plain, ball, roller, thrust, guide, flanged, pillow block, and taper bearings. Discusses bearing materials and designations.

### Low-Pressure Steam Systems
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32208-07)** Introduces the components and functions of basic steam systems, including boilers, steam traps, and blowdown recovery systems.

### High-Pressure Steam Systems and Auxiliaries
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32209-07)** Explains the functioning of high-pressure steam systems used in industry.

### Distillation Towers and Vessels
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32210-07)** Introduces the various types and functioning of distillation towers and vessels, including recovery vessels and condensate processing.

### Heaters, Furnaces, Heat Exchangers, Cooling Towers, and Fin Fans
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32211-07)** Introduces equipment used to transfer and remove heat from systems in process.

### Introduction to Tube Work
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32212-07)** Covers the basics of working with heat exchanger and furnace tubing and tube sheets.

### Advanced Trade Math
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32301-08)** Explains right triangle trigonometry and its use in the trade. Also covers interpolation, equilateral and isosceles triangles and the laws of acute triangles.

### Precision Measuring Tools
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32302-08)** 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.

### Installing Bearings
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32303-08)** Explains how to remove, troubleshoot, and install tapered, thrust, spherical roller, pillow block, and angular contact ball bearings.

### Installing Couplings
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32304-08)** Identifies various types of couplings, and covers installation procedures using the press-fit method and the interference-fit method. Also covers coupling removal procedures.

### Setting Baseplates and Prealignment
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32305-08)** 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.

### Conventional Alignment
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32306-08)** 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.

### Installing Belt and Chain Drives
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32307-08)** Covers the sizes, uses, and installation procedures of six types of drive belts and two types of chain drives.

### Installing Mechanical Seals
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32308-08)** Covers the function and advantages of mechanical seals, identifies parts and types of seals, and includes procedures for removing, inspecting and installing mechanical seals.

## Industrial Maintenance Mechanic Level 3

### Curriculum Notes
- 175 Hours
- 175 Hours
- Instructor Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

#### 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.

<table>
<thead>
<tr>
<th>Module</th>
<th>Type</th>
<th>ISBN</th>
<th>Trainee Price</th>
<th>Instructor Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification, Install, and Maintain Valves (10 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604625-7</td>
<td>$19</td>
<td>$29</td>
</tr>
<tr>
<td>Identifying, Install, and Maintain Valves (10 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604625-7</td>
<td>$19</td>
<td>$29</td>
</tr>
<tr>
<td>Identify, Install, and Maintain Valves (10 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604672-1</td>
<td>$19</td>
<td>$29</td>
</tr>
<tr>
<td>Identifying, Install, and Maintain Valves (10 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604672-1</td>
<td>$19</td>
<td>$29</td>
</tr>
<tr>
<td>Hydrostatic and Pneumatic Testing (10 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604626-4</td>
<td>$19</td>
<td>$29</td>
</tr>
<tr>
<td>Hydrostatic and Pneumatic Testing (10 Hours)</td>
<td>Trainee</td>
<td>978-0-13-604673-8</td>
<td>$19</td>
<td>$29</td>
</tr>
</tbody>
</table>

### Identify, Install, and Maintain Valves
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32205-07)** Explains how to remove and install threaded and flanged valves, how to replace valve stem O-ring and bonnet gaskets, and how to repackage a valve stuffing box. Also discusses the purpose of valve packing.

### Hydrostatic and Pneumatic Testing
- **Trainee:** $19
- **Instructor:** $29
- **(Module ID 32206-07)** Describes non-destructive and pressure testing of systems and equipment.
## Industrial Maintenance Mechanic Level 4

### Curriculum Notes
- 170 Hours
- Revised: 2009, Third Edition

### MODULES

**Preventive and Predictive Maintenance** (10 Hours)
- Trainee $19
- Instructor $19
- (Module ID 32401-09) Explains preventive and predictive maintenance and non-destructive testing, and introduces the basic techniques for testing. Also describes lubricant analysis, and acoustic, infrared, and vibration testing.

**Advanced Blueprint Reading** (25 Hours)
- Trainee $19
- Instructor $19
- (Module ID 32402-09) Describes the use of drawing sets to obtain system information. Explains the process of identifying a part of a machine for repair or replacement from a set of drawings.

**Compressors and Pneumatic Systems** (35 Hours)
- Trainee $19
- Instructor $19
- (Module ID 32403-09) Describes the theory and practice of compressing and transporting gases. Explains the types and principles of compressors and compressed air treatment equipment, as well as compressed air use and safety.

**Reverse Alignment** (30 Hours)
- Trainee $19
- Instructor $19
- (Module ID 32404-09) Describes preparation for dial indicator reverse alignment, and explains the procedures for setting up reverse alignment jigs. Explains graphic and mathematical techniques for aligning equipment based on reverse dial indicator measurements.

**Laser Alignment** (25 Hours)
- Trainee $19
- Instructor $19
- (Module ID 32405-09) Using one example system, describes the principles of using laser alignment systems to perform alignments.

**Introduction to Supervisory Skills** (15 Hours)
- Trainee $19
- Instructor $19
- (Module ID 32406-09) Introduces human resource criteria, concepts, and skills for the craftsperson desiring to advance to leadership roles.

**Troubleshooting and Repairing Gearboxes** (20 Hours)
- Trainee $19
- Instructor $19
- (Module ID 32407-09) Explains how to inspect, troubleshoot, disassemble, assemble, and install a pump. Also describes the process of preparing for startup.

**Troubleshooting and Repairing Pumps** (10 Hours)
- Trainee $19
- Instructor $19
- (Module ID 32408-09) Describes types and operation of gearboxes, and gearbox diagnostics. Explains how to troubleshoot, remove, and disassemble gearboxes, how to identify gear wear patterns, and how to install and maintain gearboxes.

### Instrumentation

### Curriculum Notes
- 210 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
- To Be Revised: Summer 2014, Third Edition
- Trainee Guide and individual trainee modules are full color.
- Instructor’s Resource Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.

### MODULES

**Orientation to the Trade** (2.5 Hours)
- Trainee $19
- Instructor $19
- (Module ID 12118-14) Describes the work typically performed by instrument fitters and technicians, along with the responsibilities and required aptitudes. Includes a description of the apprenticeship process and the career paths available in the trade.

**Instrumentation Safety Practices** (12.5 Hours)
- Trainee $19
- Instructor $19
- (Module ID 12115-14) Covers precautions for electrical hazards found on the job and teaches the OSHA-mandated lockout/tagout procedure. Identifies safety practices related to potentially hazardous tools and materials.

**Advanced Towers and Vessels** (15 Hours)
- Trainee $19
- Instructor $19
- (Module ID 12119-14) Covers basic concepts of the metric system and the conversion of English units to metric units. Also reviews basic algebra, geometric figures, and calculations associated with triangles.

**Hand and Power Tools for Instrumentation** (15 Hours)
- Trainee $19
- Instructor $19
- (Module ID 12121-14) Explains how to identify, inspect, use, and maintain the various hand and power tools used by instrument fitters and technicians.

**Craft-Related Mathematics** (10 Hours)
- Trainee $19
- Instructor $19
- (Module ID 12119-14) Covers basic concepts of the metric system and the conversion of English units to metric units. Also reviews basic algebra, geometric figures, and calculations associated with triangles.

**Instrumentation Drawings and Documents, Part One** (15 Hours)
- Trainee $19
- Instructor $19
- (Module ID 12107-14) Identifies and describes the types of drawings used in instrumentation work and familiarizes trainees with basic instrument symbols, lines, and abbreviations used on drawings.
Instrumentation Level 1 (continued)

Inspection, Handle, and Store Instrumentation Materials (2.5 Hours)
(Module ID 12304-14) Covers the methods used in receiving, inspecting, handling, and storing project-related instrumentation equipment.

Electrical Systems for Instrumentation (12.5 Hours)
(Module ID 12116-14) Covers basic electrical concepts and terms, DC circuit calculations, electrical measuring instruments, and electrical wiring.

Fasteners (7.5 Hours)
(Module ID 12106-14) Explains how to properly identify, select, and install threaded and non-threaded fasteners and anchors used in instrumentation work.

Gaskets and Packing (7.5 Hours)
(Module ID 12108-14) Teaches how to recognize, select, and properly install gaskets, packing, and O-rings. Covers the various materials used in gaskets and O-rings, along with their applications and limitations.

Lubricants, Sealants, and Cleaners (7.5 Hours)
(Module ID 12109-14) Covers the proper use, storage, handling, and safety practices associated with various lubricants, cutting fluids, sealants, and cleaners. Includes coverage of the tools and materials used in applying lubricants and cleaning products.

Tubing (7.5 Hours)
(Module ID 12111-14) Introduces types of tubing, tubing materials, fittings, and tools. Covers proper storage and handling, cutting, deburring, reaming, bending, and joining of tubing.

Steel Piping Practices (70 Hours)
(Module ID 12117-14) Covers both carbon steel and stainless steel piping measuring 2” as it applies to instrumentation work. Includes instructions for calculating pipe cut length, cutting, deburring, reaming, and threading pipe.

Hoses (7.5 Hours)
(Module ID 12113-14) Describes different types of hoses and related fittings, along with proper storage and handling. Includes instructions for cutting hoses and installing standard reusable fittings.

Module Coverage

L2 INSTRUMENTATION

Ordering information for Instrumentation Level 1, Second Edition:

<table>
<thead>
<tr>
<th>PAPERBACK</th>
<th>ISBN</th>
</tr>
</thead>
</table>

Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

Curriculum Notes
- 185 Hours
- Revised: 2003
- A revision is underway and will be in stock Spring, 2015.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PowerPoint® Presentation Slides

MODULES

Detectors, Secondary Elements, Transducers, and Transmitters (20 Hours)
(Module ID 12205-03) Introduces 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.

Controllers, Recorders, and Indicators (10 Hours)
(Module ID 12206-03) Covers theory of operation and application of industry-standard process controllers, recorders, indicators, and pneumatic and electronic equipment.

Control Valves, Actuators, and Positioners (15 Hours)
Instructor $19  ISBN 978-0-13-103288-0
(Module ID 12208-03) Presents the principles of operation and different variables measured by instrumentation relays and timers. Describes the selection of types of devices in a loop using specification sheets or samples.

Relays and Timers (7.5 Hours)
(Module ID 12209-03) Covers principles of operation and different variables measured by instrumentation switches and photoelectric devices and the selection of types of devices in a loop using specification sheets or samples.

Switches and Photoelectric Devices (5 Hours)
(Module ID 12210-03) Presents the construction, operation, and uses of switches, indicators, and photoelectric devices. Covers selection and identification of the correct component for installation using applicable specifications and schematics.

Filters, Regulators, and Dryers (7.5 Hours)
Trainee $19  ISBN 978-0-13-103275-0
Instructor $19  ISBN 978-0-13-103291-0
(Module ID 12211-03) Presents instrumentation used to sample, analyze, and/or monitor industrial processes and includes the principles of their operation. Covers selection and identification of instrumentation using technical manuals, specification sheets, pictures, or actual equipment samples.

Analyzers and Monitors (5 Hours)
(Module ID 12212-03) Explains selection of instruments to be panel-mounted, locating the instruments using drawings, and procedures for installing the instruments into the panels.

Panel-Mounted Instruments (7.5 Hours)
(Module ID 12213-03) Explains selection of instruments to be panel-mounted, locating the instruments using drawings, and procedures for installing the instruments into the panels.

Controllers, Recorders, and Indicators (10 Hours)
(Module ID 12206-03) Covers theory of operation and application of industry-standard process controllers, recorders, indicators, and pneumatic and electronic equipment.

Control Valves, Actuators, and Positioners (15 Hours)
Instructor $19  ISBN 978-0-13-103288-0
(Module ID 12208-03) Presents the principles of operation and different variables measured by instrumentation relays and timers. Describes the selection of types of devices in a loop using specification sheets or samples.

Relays and Timers (7.5 Hours)
(Module ID 12209-03) Covers principles of operation and different variables measured by instrumentation switches and photoelectric devices and the selection of types of devices in a loop using specification sheets or samples.

Switches and Photoelectric Devices (5 Hours)
(Module ID 12210-03) Presents the construction, operation, and uses of switches, indicators, and photoelectric devices. Covers selection and identification of the correct component for installation using applicable specifications and schematics.

Filters, Regulators, and Dryers (7.5 Hours)
Trainee $19  ISBN 978-0-13-103275-0
Instructor $19  ISBN 978-0-13-103291-0
(Module ID 12211-03) Presents instrumentation used to sample, analyze, and/or monitor industrial processes and includes the principles of their operation. Covers selection and identification of instrumentation using technical manuals, specification sheets, pictures, or actual equipment samples.

Analyzers and Monitors (5 Hours)
(Module ID 12212-03) Explains selection of instruments to be panel-mounted, locating the instruments using drawings, and procedures for installing the instruments into the panels.

Panel-Mounted Instruments (7.5 Hours)
(Module ID 12213-03) Explains selection of instruments to be panel-mounted, locating the instruments using drawings, and procedures for installing the instruments into the panels.
Installing Field-Mounted Instruments (25 Hours)
Trainee $19
Instructor $19
Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.

Instrument Fitter’s Math (20 Hours)
Trainee $19
Instructor $19
ISBN 978-0-13-103305-4
(Module ID 12301-03) 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.

Layout and Installation of Tubing and Piping Systems (45 Hours)
Trainee $19
Instructor $19
(Module ID 12302-03) 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.

Clean, Purge, and Test Tubing and Piping Systems (10 Hours)
Trainee $19
Instructor $19
(Module ID 12303-03) Presents safe methods for cleaning, purging, blowing down, pressure testing, and leak testing tubing, piping, and hoses used in instrumentation.

Receive, Inspect, Handle, and Store Instrumentation (2.5 Hours)
Trainee $19
Instructor $19
(Module ID 12304-03) Covers different methods for the proper handling, storage, and inspection of instrumentation equipment.

Instrumentation Electrical Circuity (25 Hours)
Trainee $19
Instructor $19
(Module ID 12305-03) Covers the theory and operation of common instrumentation circuits.

Grounding and Shielding of Instrumentation Wiring (10 Hours)
Trainee $19
Instructor $19
(Module ID 12306-03) 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.

Terminating Conductors (20 Hours)
Trainee $19
Instructor $19
ISBN 978-0-13-103303-0
(Module ID 12307-03) Teaches methods, procedures, and standards used in terminating and testing common types of conductors used in the electrical and electronic wiring of instrumentation devices.

Protective Measures for Instrumentation (20 Hours)
Trainee $19
Instructor $19
(Module ID 12308-03) Covers protective measures applied in instrumentation installations, including heat tracing, chemical treatment, and insulation.

Instrument Calibration and Configuration (65 Hours)
Trainee $19
Instructor $19
(Module ID 12402-03) 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.

Performing Loop Checks (7.5 Hours)
Trainee $19
Instructor $19
(Module ID 12403-03) Covers loop check steps, including verifying mechanical installation, validating that the loop has correct tag numbers, performing loop checks, and proving the loop.

Troubleshooting and Commissioning a Loop (10 Hours)
Trainee $19
Instructor $19
ISBN 978-0-13-109624-0
(Module ID 12404-03) 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.

Tuning Loops (15 Hours)
Trainee $19
Instructor $19
(Module ID 12405-03) 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.

Programmable Logic Controllers (10 Hours)
Trainee $19
Instructor $19
(Module ID 12406-03) 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.

Distributed Control Systems (10 Hours)
Trainee $19
Instructor $19
(Module ID 12407-03) Describes how DCS was developed by combining the technologies of single loop control, direct digital control, and supervisory control. 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.

Analyzers (20 Hours)
Trainee $19
Instructor $19
(Module ID 12408-03) Defines analyzers and their applications in industrial process control. Describes 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.
Insulating

### L1: Insulating

#### LEVEL 1

**Curriculum Notes**
- 170 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
- Updated: 1999
- A revision is underway and will be in stock 2015.
- A Spanish translation is available. Please see NCCER's online catalog for more information.

**PAPERBACK**
- Trainee Guide: $67
- 978-0-13-909359-3
- Instructor’s Guide: $67
- 978-0-13-909383-8

**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.

**Orientation (5 Hours)**
- Trainee $19
- Instructor $19
- ISBN 978-0-13-909235-0

(Module ID 19101) Provides an overview of the insulation industry, factors to consider when choosing a vacation in the insulation industry, and why insulation is used.

**Trade Relations (7.5 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19102) Discusses the importance of contracts, relationships with other members of the construction team, and effective communication.

**Tools of the Trade (7.5 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19103) Identifies tools of the insulation trade, their proper use, care, and safety procedures for each.

**Material Handling, Storage, and Distribution (2.5 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19104) Covers receiving, stacking, and storage of insulation materials, as well as material movement.

**Characteristics of Pipe Insulation (5 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19105) Covers identification of types, sizes, and uses of pipe and insulation thickness. Explains the relationship between pipe size and insulation size.

**Installing Fiberglass Pipe Insulation (20 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19106) Describes characteristics of fiberglass pipe insulation and sizing requirements, as well as characteristics of ASJ jacketing.

**Installing Insulated Pipe Fittings, Valves, and Flanges (40 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19107) 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 installing pipe flanges; and cutting and installing plug 90-degreeells.

**Installing Pipe Fittings, Valves, and Flanges (20 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19206) 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.

**Installing Rigid Foam Insulation (20 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19207) 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.

**Installing Board and Block Insulation (15 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19208) Covers the proper use of finishing tools, cleanup and protection procedures, and the limitations of cements, fabric finishes, and mastics.

**Cement and Fabric Finishes & Mastics (10 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19209) Covers cold and hot water plumbing systems, drainage systems in buildings, insulation requirements on plumbing systems, and pipe hook-ups.

**Chilled and Hot Water Heating Systems (5 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19210) 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.

### L2: Insulating

#### LEVEL 2

**Curriculum Notes**
- 147.5 Hours
- Updated: 1999

**PAPERBACK**
- Trainee Guide: $94
- 978-0-13-909417-0
- Instructor’s Guide: $94
- 978-0-13-909433-0

**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.

**Installing Flexible Foam Insulation (32.5 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19201) 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.

**Installing Blanket Insulation for Ducts (7.5 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19202) Covers fiberglass blanket installation to ducts and apparatus and discusses vapor-sealed blanket insulation facings.

**Installing Board Insulation for Ducts (20 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19203) 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.

**Installing Calcium Silicate/Expanded Perlite Pipe Insulation (15 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19204) 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.

**Installing Mineral Wool Insulation (12.5 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19205) Describes how to measure, cut, and score mineral wool insulation and discusses attachments used on mineral wool, installation methods, sealing requirements, and how to use pin welding equipment.

### L3: Insulating

#### LEVEL 3

**Curriculum Notes**
- 147.5 Hours
- Updated: 1999

**PAPERBACK**
- Trainee Guide: $94
- 978-0-13-909458-3
- Instructor’s Guide: $94
- 978-0-13-909474-3

**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.

**Trade Math (7.5 Hours)**
- Trainee $19
- Instructor $19

(Module ID 19301) 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.
Insulating Level 3 (continued)

Air Duct Systems (5 Hours)
(Module ID 19305) Covers the identification of steam and Condensate piping and describes steam and process water systems and their components.

Theory of Heat Transfer and Moisture Effects (2.5 Hours)
(Module ID 19303) Describes methods of heat transfer and moisture migration and discusses the application of various types of insulation to slow or prevent these processes.

Adhesives and Their Uses (2.5 Hours)
(Module ID 19304) Covers the identification, application, and use of adhesives.

Steam, Condensate, and Process Water Systems (5 Hours)
(Module ID 19305) Covers the identification of steam and condensate piping and describes steam and process water systems and their components.

Large Boilers, Breechings, Precipitators, and Apparatus (10 Hours)
(Instructor ID 19306) Describes boilers and related equipment, and their insulation requirements.

Refrigeration and Cryogenic Systems (2.5 Hours)
(Instructor ID 19307) Introduces air conditioning and refrigeration systems and their insulation requirements. Also describes the special insulation requirements of extremely low-temperature cryogenic systems.

Specialized Insulation Systems (5 Hours)
(Instructor ID 19308) 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.

Blueprints and Specifications (12.5 Hours)
(Instructor ID 19309) Describes how to determine the insulation requirements of a project by interpreting construction drawings. Includes a set of blueprints with the Trainee module.

Jacketing Fabrication – Piping and Fittings (42.5 Hours)
(Instructor ID 19310) Covers the identification and applications of pipes and pipe fittings and describes types of pipe and fitting jacketing, along with layout installation procedures and securements.

Jacketing Fabrication – Vessels and Equipment (40 Hours)
Trainee $19  Instructor $19  ISBN 978-0-13-910589-0
(Instructor ID 19311) Covers the identification of vessel and equipment jacketing, along with layout, fabrication, installation procedures, and securements.

Sheet Metal Lagging (12.5 Hours)
(Instructor ID 19312) Describes the identification and application of common sheet metal tools, discusses fabrication and installation methods, and covers flashing and sealing techniques.

Ironworking

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.

Introduction to the Trade (5 Hours)
Trainee $19  Instructor $19  ISBN 978-0-13-213800-0
(Instructor ID 30101-11) 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.

Trade Safety (12.5 Hours)
(Instructor ID 30102-11) 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. Explains the safe use of personnel lifts. Discusses the safe use and operation of aerial platforms, hoists, and full protection systems.

Tools and Equipment of the Trade (10 Hours)
(Instructor ID 30103-11) Identifies safety tools and equipment. Describes the proper use of hand and power tools. Identifies power sources for ironworking tools.

Fastening (5 Hours)
(Instructor ID 30104-11) Explains how to recognize A-325 and A-490 bolts, washers, and nuts. Describes how to correctly tension bolts and explains procedures for calibrated wrench and turn-of-nut tightening methods.

Mobile Construction Cranes (10 Hours)
(Instructor ID 30105-11) Identifies common lifting equipment and construction cranes. Describes how to use crane manuals, perform record keeping, and follow safety requirements. Provides procedures for assembling construction cranes.

Rigging Equipment (10 Hours)
(Instructor ID 30106-11) Describes the use and inspection of equipment and hardware used in rigging. Describes slings and explains how to determine sling capacities and angles. Covers the selection and inspection of rigging equipment, including block and tackles, chain hoists, come-alongs, jacks, and tuggers.

To Order Call: 1-800-922-0579  Stay Connected:  www.nccer.org/bookstore
Ironworking Level 1 (continued)

Rigging Practices (15 Hours)

(Module ID 30107-11) Identifies the site and environmental hazards associated with rigging. Explains how to attach rigging hardware for routine lifts and identify the components of a lift plan. Describes how to perform sling tension calculations and determine the weight of beams and basic weight estimation.

Trade Drawings One (12.5 Hours)

(Module ID 30108-11) Identifies the materials used in steel-framed buildings. Explains how to read basic structural blueprints.

Structural Ironworking One (7.5 Hours)

(Module ID 30109-11) Identifies the types of construction that utilize structural steel, the components of the structures, and the process involved in erecting a steel structure. Explains the principles of structural stresses and the requirements of bolted connections.

Plumbing, Aligning, and Guying (5 Hours)

(Module ID 30110-11) Describes the purpose and function of aligning and plumbing steel structures, the tools that are used, and the procedures for performing the plumbing and aligning. Identifies and explains column base and baseplate components and foundation failures.

Oxyfuel Cutting (17.5 Hours)

(Module ID 29102-09; from Welding Level One) Explains procedures for cutting steel with oxygen-acetylene equipment.

Introduction to Arc Welding (22.5 Hours)

(Module ID 30112-11) Identifies welding equipment and processes. Describes safety precautions associated with arc welding. Explains how to identify weld joints, their dimensions, and applications from welding symbols and drawings. Describes how to set up and use SAW welding equipment and explains the governing welding codes.

Bar Joists and Girders (5 Hours)

(Module ID 30113-11) Describes cross sections of common steel girders. Explains how to read a girder chart and design a girder to meet the requirements. Describes the procedures for rigging and stacking steel girders. Includes OSHA Subpart R.

Metal Decking (10 Hours)

(Module ID 30114-11) Identifies decking types and profiles and how decking is packaged, shipped, and stored. Describes erecting the deck and on-sight safety. Discusses the effects of deck penetrations and damage. Includes OSHA Subpart R.

Field Fabrication (15 Hours)

Instructor $19  ISBN 978-0-13-215093-4
(Module ID 30115-11) Identifies the hazards associated with field fabrication. Describes how to use common layout tools. Explains how to fabricate angle iron, channel, T-shapes, and W-shapes to given dimensions.

Intermediate Rigging (10 Hours)

Instructor $19  ISBN 978-0-13-266185-0
(Module ID 38201-11; from Intermediate Rigging)

Structural Ironworking Two (30 Hours)

(Module ID 30205-11) Describes pre-erection activities for structural steel. Provides procedures for erecting bearing devices, columns, beams, girders, joists, bracing, and bridging.

Steel Joists and Joist Girders (15 Hours)

Instructor $19  ISBN 978-0-13-266466-0
(Module ID 30206-11) 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. Describes the conditions necessary and the benefits of panelizing bar joist.

Tower Cranes (15 Hours)

(Module ID 30207-11) Describes safe practices when erecting steel using tower cranes. Explains the difference between erecting steel with a mobile crane versus a tower crane. Describes tower crane hand and verbal signals.

Survey Equipment Use and Care One (10 Hours)

Instructor $19  ISBN 978-0-13-266468-4
(Module ID 30208-11) Identifies survey equipment and uses. Explains the proper set up and use of a builder’s level and a theodolite. Covers how to shoot elevations, sweep a column for plum, and set up over a point and back sight to another point.

L2 IRONWORKING

Curriculum Notes

- 162.5 Hours
- Revised: 2011, Second Edition
- Trainee Guide and trainee modules are in full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK


Product Supplements

PowerPoint® Presentation Slides
ISBN 978-0-13-266254-3  $40

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.

Trade Math (25 Hours)

(Module ID 30201-11) Explains fractions and basic math, and includes multiple opportunities for practical applications.

Weld Quality (10 Hours)

Instructor $19  ISBN 978-0-13-275110-0
(Module ID 29106-09; from Welding Level One) Explains how to prepare arc welding equipment and how to make flat welds, horizontal welds, vertical welds, and overhead welds.

Position Arc Welding (20 Hours)

(Module ID 30202-11) Identifies and explains weld joints, weld positions, and open V-notch welds. Describes how to prepare arc welding equipment and how to make flat welds, horizontal welds, vertical welds, and overhead welds.

Forklifts (17.5 Hours)

(Module ID 30203-11) Identifies the basic components of forklifts and the corresponding hand signals. Explains safe practices and how to perform inspections. Covers how to read load charts and how to operate forklifts.

Trade Drawings Two (10 Hours)

@Module ID 30204-11) 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.

L3 IRONWORKING

Curriculum Notes

- 150 Hours
- Revised: 2012, Second Edition
- Trainee Guide and trainee modules are in full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK


Product Supplements

PowerPoint® Presentation Slides

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.

Applied Trade Math (5 Hours)

(Module ID 30313-12) Explains the math needed to calculate the size of cribbing or blocking needed for a load; parts of line, maximum load, and line pull for lifting operations; sling capacities; and load distribution for two-crane lifts.
Flux Core for Ironworking (40 Hours)
Trainee $19
Instructor $19
(Module ID 30304-12) Describes the equipment and methods used in flux core arc welding (FCAW). Includes proper selection and use of filler metals and shielding gases, as well as techniques for performing fillet and V-groove welding in various positions.

Stud Welding (10 Hours)
Trainee $19
Instructor $19
(Module ID 30304-12) 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.

Structural Ironworking Three (10 Hours)
Trainee $19
Instructor $19
(Module ID 30312-12) Explains the techniques used to plum, align and guy steel structures, including the associated hazards and risks. Provides information and procedures related to the installation of trusses and curtain walls.

Advanced Rigging (10 Hours)
Trainee $19
Instructor $19
(Module ID 38301-11; from Advanced Rigging)

Precast/Tilt-Up Erection (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 30311-12) Describes the fabrication and uses of precast concrete elements and cast-in-place tilt-up wall systems. Focuses on rigging practices associated with these two distinct construction methods and the role of ironworkers in their installation.

Special Application Hoisting Devices (10 Hours)
Trainee $19
Instructor $19
(Module ID 30307-12) Explains techniques for rigging and moving equipment using a variety of hoisting devices, including gin poles, Chicago beams, A-frames, davits, balance beams, pump handles, high lines, caterpillar dollies, rollers. Also covers special cranes, including demicks, gantries, HLDs, trolley cranes, and jacking frames.

Survey Equipment Use and Care Two (15 Hours)
Trainee $19
Instructor $19
(Module ID 30315-12) This module focuses on the total station and its uses, including setup and controls. It includes information on primary and secondary control points and procedures for turning horizontal angles and plumbing columns and wall panels.

Pre-Engineered Systems (5 Hours)
Trainee $19
Instructor $19
(Module ID 30302-12) Identifies the structural components and accessories of metal buildings and describes their installation. Describes the pre-erection and erection procedures that apply to their installation and the safety precautions associated with their installation.

Miscellaneous/Ornamental Ironworking (5 Hours)
Trainee $19
Instructor $19
ISBN 978-0-13-292289-0
(Module ID 30303-12) 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.

Grating and Checkered Plate (5 Hours)
Trainee $19
Instructor $19
(Module ID 30316-12) Provides general information and procedures for the installation and attachment of gratings and checkered plate. Describes the rigging methods associated with grating and checker plate.

Air Carbon Arc Cutting and Gouging (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 29104-09; from Welding Level One)

Demolition (10 Hours)
Trainee $19
Instructor $19
ISBN 978-0-13-292304-0
(Module ID 30310-12) Identifies the tools used to remove rivets and explains the demolition skills required to safely remove structural steel beams, steel columns, and steel reinforced concrete columns.

Masonry

Masonry Level 3 (continued)

L1 MASONRY

LEVEI 1

REVISED!

Curriculum Notes

• 205 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
• Revised: 2013, Fourth Edition
• Trainee Guide and trainee modules are in full color.
• Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint slides, performance profile sheets and TestGen software.
• A Spanish translation of the third edition is available. Please see NCCER’s online catalog for more information.

HARDCOVER
Trainee Guide: $69
978-0-13-375402-5
PAPERBACK
Trainee Guide: $67
978-0-13-340248-3
Instructor’s Res. Access Card: $67
978-0-13-340384-8

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.

Introduction to Masonry (12.5 Hours)
Trainee $19
Instructor $19
(Module 28101-13) Describes information on using personal protective equipment, working safely from elevated surfaces, properly using masonry tools and equipment, and handling masonry materials safely.

Masonry Safety (15 Hours)
Trainee $19
Instructor $19
ISBN 978-0-13-377937-0
(Module 28104-13) Describes how to identify the common causes of accidents and the hazards associated with masonry tools, equipment, mortar, and concrete. Provides information on using personal protective equipment, working safely from elevated surfaces, properly using masonry tools and equipment, and handling masonry materials safely.

Masonry Tools & Equipment (15 Hours)
Trainee $19
Instructor $19
(Module 28102-13) Describes a variety of hand tools, measuring tools, mortar equipment, power tools and equipment, and lifting equipment that masons use on the job, and explains how to use these tools correctly and safely. Provides instructions for assembling and disassembling scaffolds.
To Order Call: 1-800-922-0579 www.nccer.org/bookstore

Masonry Level 1 (continued)

Measuresments, Drawings, and Specifications
(10 Hours)
Instructor $19  ISBN 978-0-13-377940-0
(Module 28103-13) Reviews the calculation of distances and areas common in masonry work, describes the information found on construction drawings, and explains the role of specifications, standards, and codes.

Mortar
(10 Hours)
(Module 28104-13) Explains the types and properties of mortar and the materials used in the mixture, including admixtures; provides instructions for mixing mortar by machine; and describes how to properly apply and store mortar.

Masonry Units and Installation Techniques
(60 Hours)
Instructor $19  ISBN 978-0-13-377942-4
(Module 28105-13) Describes characteristics of block and brick; how to set up, lay out, and bond block and brick; how to cut block and brick; how to lay and tool block and brick; and how to clean block and brick once they have been laid. Provides information about masonry reinforcements and accessories used to lay block and brick professionally and safely.

Reinforced Masonry (20 Hours)
(Module ID 28203-14) 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 reinforced masonry elements, such as rebar and bond beam lintels.

Masonry Openings and Metalwork (20 Hours)
(Module ID 28204-14) Introduces types of metal components, including metal rods, joint reinforcements, plates, anchors, fasteners, and hollow metal frames for doors and windows, and explains how they are installed.

Advanced Laying Techniques (40 Hours)
Instructor $19  ISBN 978-0-13-382751-4
(Module ID 28205-14) Describes the construction of masonry wall systems, weep vents, and joints. Includes safety requirements and interaction with structural components.

Effect of Climate on Masonry (20 Hours)
(Module ID 28206-14) Describes materials and techniques used to apply insulation and methods of moisture control as they relate to the mason’s trade. Includes hot- and cold-weather considerations.

Construction Inspection and Quality Control (15 Hours)
(Module ID 28207-14) Introduces the quality control requirements for masonry construction. Presents procedures for inspection and testing of masonry materials and finished masonry construction.

Ordering information for Masonry Level 2, Third Edition:

Trainee Guide: $94
Instructor’s Guide: $94

PowerPoint® Presentation Slides
S40

L3 MASONRY

Curriculum Notes
(168.5 Hours (146 required; 22.5 elective/optional)

•  To Be Revised: Summer 2014, Fourth Edition
•  Revised: 2005, Third Edition

Instructor’s Guide includes access code to download TestGen software.

Ordering information for Masonry Level 3, Fourth Edition, due in stock Fall 2014:

Trainee Guide: $94
Instructor’s Res. Access Card: $94

PowerPoint® Presentation Slides
S40

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.

Residential Plans and Drawing Interpretation
(12.5 Hours)
Instructor $19  ISBN 978-0-13-382525-1
(Module ID 28201-14) Explains how to work with residential plans and construction drawings and convert that information into action on the job. Describes the organization and format of plans, dimensioning and scaling, and estimating materials quantities from information on the plans.

Residential Masonry
(25 Hours)
(Module ID 28202-14) 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.

Reinforced Masonry in High-Rise Construction
(17.5 Hours)
(Module ID 28306-05) Covers the principles, equipment, and methods used to perform distance measurement and differential leveling. Presents the layout responsibilities of surveyors, field engineers, and masons; how to understand and use site/plat drawing plans; and methods used for on-site communication.

Introductory Skills for the Crew Leader
(16 Hours)
(Module ID 28307-05) Covers 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 Guide: $94
Instructor’s Res. Access Card: $94
Millwright

LEVEL 1

Oxyfuel Cutting (15 Hours)
Trainee $19
Instructor $19
(Module ID 15106-06) Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and provides instructions for setting up, lighting, and using the equipment. Describes how to perform straight line cutting, piercing, beveling, washing, and gouging.

LEVEL 2

Curriculum Notes
- 150 Hours
- Revised: 2007, Third Edition
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

Product Supplements

Intermediate Trade Math (10 Hours)
Trainee $19
Instructor $19
(Module ID 15301-08) Explains right triangle trigonometry and its use in the trade. Also covers interpolation, equilateral and isosceles triangles, and the laws of obtuse triangles.

Advanced Trade Math (20 Hours)
Trainee $19
Instructor $19
(Module ID 15301-08) Explains right triangle trigonometry and its use in the trade. Also covers interpolation, equilateral and isosceles triangles, and the laws of obtuse triangles.


LEVEL 3

Curriculum Notes
- 160 Hours
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

Product Supplements
Installing Packing (10 Hours)

(Module ID 15303-08) 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.

Installing Seals (5 Hours)

(Module ID 15304-08) Covers the applications, removal, and installation procedures for dynamic and static seals, and lip, cup, oil, and labyrinth seals.

Installing Mechanical Seals (20 Hours)

Instructor $19  ISBN 978-0-13-604781-0
(Module ID 15305-08) Covers the function and advantages of mechanical seals, identifies parts and types of seals, and includes procedures for removing, inspecting, and installing mechanical seals.

Removing and Installing Bearings (20 Hours)

(Module ID 15306-08) Explains how to remove, troubleshoot, and install tapered, thrust, spherical roller, pillow block, and angular contact ball bearings.

Couplings (15 Hours)

(Module ID 15307-08) Identifies types of couplings and covers installation procedures using the press-fit method and the interference-fit method. Also covers coupling removal procedures.

Fabricating Shims (5 Hours)

(Module ID 15308-08) Describes types of shim stock and materials and explains the procedures for fabricating shims.

Alignment Fixtures and Specialty Jigs (10 Hours)

(Module ID 15309-08) Explains the applications and fabrication procedures for angle iron, chain, complex reverse-indicator, Christmas tree, and piano wire jigs.

Prealignment for Equipment Installation (15 Hours)

Instructor $19  ISBN 978-0-13-604778-0
(Module ID 15310-08) 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.

Installing Belt and Chain Drives (10 Hours)

(Module ID 15311-08) Covers the sizes, uses, and installation procedures of six types of drive belts and two types of chain drives.

Installing Fans and Blowers (10 Hours)

(Module ID 15312-08) Explains how to install axial-flow fans, centrifugal fans, and roots-type and screw-type blowers.

Troubleshooting and Repairing Mechanical Seals (15 Hours)

(Module ID 15306-08) Explains the interference-fit method. Also covers coupling removal procedures.

Troubleshooting and Repairing Pumps (7.5 Hours)

(Module ID 15401-08) Describes conveyor systems and their principles of operation.

Troubleshooting and Repairing Conveyors (12.5 Hours)

(Module ID 15402-08) Defines maintaining and repairing belt, roller, chain, screw, and pneumatic conveyors.

Conventional Alignment (30 Hours)

Instructor $19  ISBN 978-0-13-60481-0
(Module ID 15403-08) Explains the procedures involved in aligning shafts, first with straight edge and feeler gauges, then with dial indicators.

Troubleshooting and Repairing Gearboxes (20 Hours)

(Module ID 15404-08) Describes common pumps and their principles of operation. Explains centrifugal, rotary, reciprocating and metering pumps. Describes net positive suction head and cavitation.

Troubleshooting and Repairing Hydraulic Pumps (7.5 Hours)

Instructor $19  ISBN 978-0-13-60483-4
(Module ID 15405-08) Describes inspecting, troubleshooting, assembling and disassembling pumps. Explains installing pumps, and preparing them for startup. Discusses shutdown, repair, and removal of pumps from the system.

Compressors and Compressor Maintenance (20 Hours)

(Module ID 15406-08) Introduces compressors and the troubleshooting and maintenance procedures associated with compressors.
Mobile Crane Operations

**Reverse Alignment (30 Hours)**
- **Instructor S19** ISBN 978-0-13-610467-4
  (Module ID 15502-09) Using one example system, describes the principles of using laser alignment systems to perform alignments.

**Laser Alignment (25 Hours)**
- **Instructor S19** ISBN 978-0-13-610467-4
  (Module ID 15502-09) Using one example system, describes the principles of using laser alignment systems to perform alignments.

**Advanced Blueprint Reading (25 Hours)**
- **Instructor S19** ISBN 978-0-13-610468-1
  (Module ID 15503-09) Describes the use of drawing sets to obtain information about a system. Explains the process of identifying a part of a machine for repair or replacement from a set of drawings.

**Optical Alignment (25 Hours)**
- **Instructor S19** ISBN 978-0-13-610470-4
  (Module ID 15504-09) Describes how to use theodolites, optical levels, auto levels, and total stations to place and align equipment.

**Turbines (20 Hours)**
- **Trainee S19** ISBN 978-0-13-610496-4
- **Instructor S19** ISBN 978-0-13-610471-1
  (Module ID 15505-09) Describes types of turbines and their components. Describes the operation and common applications of particular types, including gas, steam, and water turbines.

**Maintaining and Repairing Turbine Components (15 Hours)**
- **Instructor S19** ISBN 978-0-13-610472-8
  (Module ID 15506-09) Describes the process of inspecting and repairing key components of turbines. Explains the guidelines for maintaining large steam turbines.

**Installing Electric Motors (10 Hours)**
  (Module ID 15507-09) Describes different types of electric motors, and presents basic guidelines for the installation of motors.

**Preventive and Predictive Maintenance (10 Hours)**
- **Instructor S19** ISBN 978-0-13-610509-1
  (Module ID 15508-09) Explains preventive and predictive maintenance programs. Provides information on nondestructive testing, and introduces the basic techniques for NDE. Lubricant analysis, and acoustic, infrared, and vibration testing are also discussed.

**Vibration Analysis (5 Hours)**
  (Module ID 15509-09) Explains the causes of vibration and the procedures and types of equipment used in vibration analysis. Describes the equipment used for vibration testing and monitoring. Describes field machine balancing.

---

**Level 1 MOBILE CRANE OPERATIONS**

**Basic Principles of Cranes (15 Hours)**
- **Instructor S19** ISBN 978-0-13-160072-0
  (Module ID 21102-04) Introduces mobile crane equipment with an in-depth discussion of terminology and nomenclature. Explains the basic scientific principles associated with mobile crane operation.

**Rigging Practices (15 Hours)**
- **Instructor S19** ISBN 978-0-13-160073-7
  (Module ID 21103-04) Presents the fundamentals of rigging. Discusses a variety of rigging gear, components, and configurations and their applications within the mobile crane industry.

**Crane Safety (15 Hours)**
- **Instructor S19** ISBN 978-0-13-160074-4
  (Module ID 21104-04) Introduces various safety aspects of mobile crane operation, including equipment inspection, site hazard identification, and required personal protective equipment. Explains how to work with site plans and specifications.

**Operating a Crane (25 Hours)**
- **Instructor S19** ISBN 978-0-13-160075-1
  (Module ID 21105-04) Describes the basic functions of a crane, as well as standard procedures for starting up and shutting down a crane. Provides an opportunity to become familiar with the actual operation of a crane and the functions of its controls.

---

**Level 2 MOBILE CRANE OPERATIONS**

**Curriculum Notes**
- **147 Hours** (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
- **Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.**

**PAPERBACK**
- **Trainee Guide:** ISBN 978-0-13-109864-0
- **Instructor’s Guide:** ISBN 978-0-13-109865-7

**Product Supplements**

**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.

**Orientation to the Trade (5 Hours)**
  (Module ID 21101-04) Provides an overview of the entire course and highlights the duties and responsibilities of a mobile crane operator. Discusses ASME B30.5 and OSHA 550, as well as career opportunities and operator requirements.

To Order Call: 1-800-922-0579 www.nccer.org/bookstore
Mobile Crane Operations Level 2 (continued)

Machine Power Flow (27.5 Hours)
(Module ID 21202-04) Discusses the power systems that enable cranes to perform. Discusses diesel and gas engine systems.

Preventive Maintenance (22.5 Hours)
(Module ID 21203-04) Covers crane prevention maintenance and compliance inspections. Presents safety, procedure and equipment/materials considerations for inspections.

Wire Rope (25 Hours)
Instructor $19  ISBN 978-0-13-160090-4
(Module ID 21204-04) 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.

Computer Aids/Operator Aids (20 Hours)
(Module ID 21205-04) Provides information on load moment indicators, anti-two-block devices, load indicators, and other operator aids that are installed in cranes. Describes input devices associated with these operator aids and the information they provide.

Load Dynamics (15 Hours)
Instructor $19  ISBN 978-0-13-160092-8
(Module ID 21206-04) Covers load stability/operational stability, operational quadrants, submerged lifts, non-centered lifts, and other factors that affect stability.

On-Site Equipment Movement (25 Hours)
(Module ID 21207-04) Covers site hazards and restrictions that could hinder on-site crane movement, safety considerations involved in crane movement over uneven ground, pick-and-carry operations, and power line contact. Addresses flotation capacity.

Advanced Operational Techniques (20 Hours)
(Module ID 21208-05) Discusses lift plan implementation, including reference information, calculations, single- and multiple-crane lifting, critical lifts, and engineering considerations.

Emergency Procedures (15 Hours)
(Module ID 21209-05) Includes information on accident prevention and investigation, the hazards of power line contact, and failures that may occur during lifting operations.

Transporting Requirements (10 Elective Hours)
(Module ID 21210-05) 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 transportation.

Safety (10 Hours)
(Module ID 21211) Provides an overview of construction site hazards and safety precautions for those in the painting trade.

Painting

Painting

L1 PAINTING - COMMERCIAL & RESIDENTIAL

Curriculum Notes
• 152.5 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
• Revised: 1997


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.

Training in the Painting Trade (5 Hours)
Instructor $19  ISBN 978-0-13-874256-0
(Module ID 21212) 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.

Safety (70 Hours)
(Module ID 07102) Provides an overview of construction site hazards and safety precautions for those in the painting trade. Covers methods of rigging and care of ladders, scaffolds, swing devices, and other equipment.
L2  PAINTING - COMMERCIAL & RESIDENTIAL  LEVEL 2

Curriculum Notes

• 145 Hours
• Revised: 1997

PAPERBACK  ISBN
Trainee Guide:  $94  978-0-13-771296-0

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.

Painting Failures and Remedies (7.5 Hours)

Note: (Module ID 07201) Describes failures of paints/coatings on an exterior and interior substrates, causes of these failures, and their remedies. Focuses on the nature of the substrates, application procedures, and surface preparation.

Job Planning and Completion (7.5 Hours)
Instructor  $19  ISBN  978-0-13-874579-0

Note: (Module ID 07202) Explains 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.

Chemical Cleaning and Stripping (7.5 Hours)
Instructor  $19  ISBN  978-0-13-874652-0

Note: (Module ID 07203) Describes chemical cleaners and strippers and how they are used to clean and/or remove unwanted material from substrates.

Low-Pressure Water Cleaning (7.5 Hours)

Note: (Module ID 07204) Covers the design and function of low-pressure washing equipment, including procedures for the safe operation and maintenance of typical equipment.

Abrasive Blasting (7.5 Hours)
Instructor  $19  ISBN  978-0-13-874793-0

Note: (Module ID 07205) Covers the basic design and function of abrasive blasting equipment, including general procedures for its use, related industry standards, and safety and health considerations.

Drywall Finishing and Patching (25 Hours)
Instructor  $19  ISBN  978-0-13-874751-0

Note: (Module ID 07206) Covers the materials and procedures used for drywall finishing and patching. Emphasizes techniques for finishing and patching drywall, including the use and care of tools, equipment and supplies, and safety.

Stains (7.5 Hours)
Instructor  $19  ISBN  978-0-13-874595-0

Note: (Module ID 07207) Describes the different classes and/or kinds of stains, including their composition, selection for use, and application considerations.

Clear Finishes (7.5 Hours)
Instructor  $19  ISBN  978-0-13-874694-0

Note: (Module ID 07208) Introduces the composition, uses, and application of clear finishes, including varnishes, lacquers, shells, and urethanes.

Wood Finishing (22.5 Hours)
Instructor  $19  ISBN  978-0-13-874777-0

Note: (Module ID 07209) Presents the science and technology of wood and wood products. Provides procedures and techniques for wood surface preparation and the application of clear finishes to various kinds of wood.

Coatings (210 Hours)

Note: (Module ID 07210) Introduces the unique properties of high-performance coatings. Includes safety and health considerations, surface preparation, application, testing, and inspection.

Spray Painting (Conventional, Airless and HVLP) (32.5 Hours)

Note: (Module ID 07211) Covers the design and function of conventional, airless, and HVLP spraying equipment, including procedures for the safe operation and maintenance of typical equipment.

L3  PAINTING - COMMERCIAL & RESIDENTIAL  LEVEL 3

Curriculum Notes

• 152.5 Hours
• Revised: 1998

PAPERBACK  ISBN
Instructor’s Guide:  $94  978-0-13-949066-8

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.

Painting Failures and Remedies Two (7.5 Hours)

Note: (Module ID 07301) Explains how to recognize and remedy paint/coating failures caused by improper preparation and application of coatings, as well as coating discoloration.
Painting Level 3 (continued)

Job Supervision, Planning, and Control

(15 Hours)
Trainee $19
Instructor $19


(Module ID 07302) 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.

Coatings Three

(15 Hours)
Trainee $19
Instructor $19


(Module ID 07303) 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.

Color and Tinting

(10 Hours)
Trainee $19
Instructor $19

ISBN 978-0-13-874876-0

(Module ID 07304) Presents the theory and definition of color. Describes procedures for mixing, tinting, and matching colors. The use of the color wheel and the Munsell, Federal Standard 595B, and other color systems are also explained.

Decorative (Faux) Finishes

(22.5 Hours)
Trainee $19
Instructor $19

ISBN 978-0-13-875121-0

(Module ID 07305) Describes techniques for glazing, antiquing, stippling, matting, gilding, marbling, and graining decorative finishes.

Wallcovering

(40 Hours)
Trainee $19
Instructor $19


(Module ID 07306) Covers the wallcovering process from start to finish. Includes equipment and materials, estimating methods, surface preparation, adhesives and installation, and failures and remedies.

Graphics

(12.5 Hours)
Trainee $19
Instructor $19

ISBN 978-0-13-874975-0

(Module ID 07307) Describes 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.

Texturing

(10 Hours)
Trainee $19
Instructor $19


(Module ID 07308) Explains the characteristics of various texturing materials, surface preparation procedures, and techniques for producing different patterns.

Spraying with Special Devices

(20 Hours)
Trainee $19
Instructor $19

ISBN 978-0-13-874892-0

(Module ID 07309) 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.

L4 PAINTING - INDUSTRIAL

Curriculum Notes

- 125.5 Hours
- Published: 1998
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccer.org.

PAPERBACK

$40

Surface Preparation Three (7.5 Hours)
Trainee $19
Instructor $19


(Module ID 07406) Covers the tools, materials, and methods used for cleaning and preparing surfaces/substrates by chemical stripping, picking, high-pressure water-jetting, and ultra high-pressure water jetting. Bases content on the methods and procedures specified by the following SSPC/NACE standards: SSPCSp8 and SSPCSp12/NACE 5.

Industrial Coatings (12.5 Hours)
Trainee $19
Instructor $19


(Module ID 07407) 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. Introductes the unique properties, safety and health considerations, and surface preparation and application of high-performance coatings used to protect substrates for industrial applications.

Coating Application and Equipment (25 Hours)
Trainee $19
Instructor $19


(Module ID 07408) Covers 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.

Quality Inspections (15 Hours)
Trainee $19
Instructor $19


(Module ID 07409) Introduces 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 ASTM and SSPC/NACE standards governing quality control and quality assurance.

Coatings Failures and Analysis (7.5 Hours)
Trainee $19
Instructor $19


(Module ID 07410) Explains how to recognize failures of paints/coatings on exterior and interior substrates, causes of these failures, and their remedies. Focuses on the nature of the substrates, application procedures, and surface preparation.

Specialty Materials (7.5 Hours)
Trainee $19
Instructor $19


(Module ID 07411) 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.
Pipefitting

**L1 PIPEFITTING LEVEL 1**

**Curriculum Notes**

- 152.5 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
- Revised: 2006, Third Edition
- Includes full color insert
- A Spanish translation is available. Please see NCCER’s online catalog for more information.

**PAPERBACK**

*PowerPoint® Presentation Slides ISBN 978-0-13-602530-6*  
*978-0-13-613602-6*  
*978-0-13-613612-5*  
*978-0-13-613603-3*  
*978-0-13-613600-2*  
*978-0-13-613601-9*  
*978-0-13-613608-7*  
*978-0-13-613595-1*  
*978-0-13-613609-5*  
*978-0-13-613590-0*

**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.

**Orientation to the Trade (5 Hours)**

*Trainee $19 ISBN 978-0-13-229020-3*
*(Module ID 08101-06) Provides an overview of work performed by the pipefitter, as well as the responsibilities, career opportunities, and safety principles associated with the pipefitting trade.*

**Pipefitting Hand Tools (20 Hours)**

*Trainee $19 ISBN 978-0-13-229021-0*
*(Module ID 08102-06) Covers hand tool safety as well as procedures for selecting, inspecting, using, and maintaining hand tools used by pipefitters. Includes pipe wrenches, pipe stands, pipe vises, levels, pipe fabrication tools, pipe bending tools, and pipe joining tools.*

**Pipefitting Power Tools (15 Hours)**

*Trainee $19 ISBN 978-0-13-229023-4*
*Instructor $19 ISBN 978-0-13-229029-6*  
*(Module ID 08103-06) Covers 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.*

**Oxyfuel Cutting (17.5 Hours)**

*(Module ID 08104-06) Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and provides instructions for setting up, lighting, and using the equipment. Explains how to perform straight line cutting, piercing, beveling, washing, and gouging.*

**Ladders and Scaffolds (12.5 Hours)**

*Trainee $19 ISBN 978-0-13-229025-8*
*Instructor $19 ISBN 978-0-13-229032-6*  
*(Module ID 08105-06) Describes hazards and safety procedures governing the use of stepladders, extension ladders, fixed scaffolds, and rolling scaffolds. Includes general procedures for scaffold assembly and use.*

**Motorized Equipment (10 Hours)**

*Trainee $19 ISBN 978-0-13-229026-5*
*Instructor $19 ISBN 978-0-13-229033-3*  
*(Module ID 08106-06) 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.*

**Threaded Pipe Fabrication (15 Hours)**

*(Module ID 08205-06) 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.*

**Socket Weld Pipe Fabrication (25 Hours)**

*Trainee $19 ISBN 978-0-13-613601-9*
*Instructor $19 ISBN 978-0-13-613611-8*  
*(Module ID 08206-06) 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.*

**Butt Weld Pipe Fabrication (37.5 Hours)**

*Trainee $19 ISBN 978-0-13-613602-6*
*Instructor $19 ISBN 978-0-13-613612-5*  
*(Module ID 08207-06) 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 the use and care of welding clamps.*

**Excavations (10 Hours)**

*Trainee $19 ISBN 978-0-13-613603-3*
*(Module ID 08208-06) Explains the use of sharing materials per OSHA standards. Covers sharing systems, installing a hydraulic vertical shore, determining the overall fall of a sewer line, setting the grade and elevation of a trench, and backfilling.*

**Underground Pipe Installation (20 Hours)**

*Trainee $19 ISBN 978-0-13-613604-0*
*Instructor $19 ISBN 978-0-13-613580-7*  
*(Module ID 08209-06) Explains pipe installation procedures and guidelines, including the procedures for cast iron, ductile iron, concrete, steel, fiberglass, and thermoplastic pipe. Includes an introduction to horizontal directional drilling for pipe installation.*

**CURRICULUM NOTES**

- 150 Hours
- Revised: 2007, Third Edition

**PAPERBACK**

*PowerPoint® Presentation Slides ISBN 978-0-13-602623-5*  
*978-0-13-613601-9*  
*978-0-13-613608-7*  
*978-0-13-613590-0*  
*978-0-13-613595-1*  
*978-0-13-613609-5*  
*978-0-13-613590-0*  
*978-0-13-608658-1*  
*40*

**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.

**Piping Systems (5 Hours)**

*Instructor $19 ISBN 978-0-13-613606-4*  
*(Module ID 08201-06) Introduces chemical, compressed air, fuel oil, steam, and water systems. Explains how to identify piping systems according to color codes.*

**Drawings and Detail Sheets (15 Hours)**

*(Module ID 08202-06) Introduces plot plans, structural drawings, elevation drawings, as-built drawings, equipment arrangement drawings, P&IDs, isometric drawings, spool sheets, and detail sheets.*

**Identifying and Installing Valves (20 Hours)**

*Instructor $19 ISBN 978-0-13-613608-5*  
*(Module ID 08203-06) Identifies types of valves and describes their installation as well as storage and handling.*

**Pipefitting Trade Math (15 Hours)**

*Instructor $19 ISBN 978-0-13-613609-5*  
*(Module ID 08204-06) Explains how to use ratios and proportions, solve basic algebra, area, volume, and circumference problems, and solve for right triangles using the Pythagorean theorem.*

To Order Call: 1-800-922-0579  Stay Connected: www.nccer.org/bookstore  51
Pipefitting Level 3 (continued)

Rigging Equipment (10 Hours)
Trainee $19  
Instructor $19  
ISBN 978-0-13-614636-0
(Module ID 08301-07) Describes the use and inspection of basic equipment and hardware used in rigging, including slings, wire rope, chains, and attaching hardware. Explains slang angles. Describes the use of tuggers, jacks, hoists, and come-alongs.

Rigging Practices (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 08302-07) 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.

Standards and Specifications (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 08303-07) Explains how to read and interpret pipelifiting standards, codes, and specifications. Describes how to identify pipe and components according to specifications.

Advanced Trade Math (25 Hours)
Trainee $19  
Instructor $19  
(Module ID 08304-07) Discusses the use of equivalent and conversion tables. Explains how to use right angle trigonometry to calculate take-outs.

Motorized Equipment II (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 08305-07) Covers the applications and safety requirements of drain cleaners, personnel lifts, and cable lifts.

Introduction to Aboveground Pipe Installation (20 Hours)
Trainee $19  
Instructor $19  
(Module ID 08306-07) Identifies various types of pipe, flanges, gaskets, and bolts. Includes step-by-step procedures for installing pipe sleeves and floor penetrations.

Field Routing and Vessel Trim (15 Hours)
Trainee $19  
Instructor $19  
(Module ID 08307-07) Explains how to secure the work area and determine field run specifications, load weights for erection equipment, and support needs. Describes how to erect vessel trim.

Pipe Hangers and Supports (25 Hours)
Trainee $19  
Instructor $19  
(Module ID 08308-07) Explains how to identify, select, and install pipe hangers and supports, including spring cant supports.

Testing Piping Systems and Equipment (20 Hours)
Trainee $19  
Instructor $19  
(Module ID 08309-07) Explains how to perform pretests, service flow tests, head pressure tests, hydrostatic tests, and steam blow tests.

Instructor's Guide: $94  
Trainee Guide: $94

PAPERBACK  
ISBN 978-0-13-614430-4

Product Supplements  
PowerPoint® Presentation Slides  
S40

LEVEL 4  
CURRICULUM NOTES  
182.5 Hours  
Revised: 2007, Third Edition  
Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

L4 PIPEFITTING

MODULES

Pipefitting Level 3 (continued)

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.

Advanced Blueprint Reading (50 Hours)
Trainee $19  
Instructor $19  
(Module ID 08401-07) Introduces drawings used by pipefitters in the shop and in the field. Explains how to read and interpret P&IDs, general arrangement drawings, ISOs, and spool sheets. Included are step-by-step instructions for following a line of pipe through a set of drawings. Includes nine 11” x 17” drawings.

Advanced Pipe Fabrication (50 Hours)
Trainee $19  
Instructor $19  
(Module ID 08402-07) Discusses how to lay out and fabricate mitered bends, laterals, wyes, and ninety-degree intersections using tables of ordinates or a calculator. This knowledge is required in order to fabricate specialty bends and intersections.

Stress Relieving and Aligning (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 08403-07) Explains the nature of misalignment and methods of correcting it. Includes terminology that will help pipefitters communicate with millwrights who perform pump setup.

Steam Traps (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 08404-07) Describes types of steam traps, how they function, and the basic methods for troubleshooting them.

In-Line Specialties (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 08405-07) Describes specialty devices used in pipelines, including: bleed rings; ball and expansion joints; measuring devices for temperature, level, flow rate, and pressure; steam traps; drip legs; and desuperheaters. The purpose and function of each type is explained.

Special Piping (25 Hours)
Trainee $19  
Instructor $19  
(Module ID 08406-07) Discusses methods of assembling copper and plastic pipe and tubing. Introduces brazing and soldering, and explains the differences between these two procedures. Also describes compression and flared fittings, and grooved and compression formed joining methods.

Hot Taps (10 Hours)
Trainee $19  
Instructor $19  
(Module ID 08407-07) Explains the mechanics of attaching fittings to the pipeline while the line is under pressure. Covers line stopping, freeze stopping, and adding connections to the line.

Maintaining Valves (10 Hours)
Trainee $19  
Instructor $19  
ISBN 978-0-13-604794-0
(Module ID 08408-07) Explains how to replace packing and O-rings, and how to open and close a valve’s bonnet. Discusses how to safely troubleshoot and maintain several types of valves.

Introduction to Supervisory Roles (7.5 Hours)
Trainee $19  
Instructor $19  
(Module ID 08409-07) Offers basic information for pipefitters who have a desire to move into supervisory roles. Provides information on issues related to cultural differences, gender-based social behaviors, and legal and ethical situations that a supervisor is likely to encounter.
**LEVEL 1**

**Tools and Equipment (22.5 Hours)**
- **Trainee $19**
- **Instructor $19**
  (Module ID 24102) Describes the safe use, care, and maintenance of pipelayer hand and power tools. Discusses methods for operating and maintaining dewatering equipment, generators, and compressors. Contains an introduction to drilling and tapping machines.

**Rigging and Delivering Pipe and Associated Structures (7.5 Hours)**
- **Trainee $19**
- **Instructor $19**
  (Module ID 24103) Describes 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.

**Cutting Pipe (12.5 Hours)**
- **Trainee $19**
- **Instructor $19**
  (Module ID 24104) Discusses practical methods for safely cutting common pipe materials. Describes pipe materials and standard sizes for thermoplastic, concrete, ductile iron, and corrugated steel pipe.

**Gaskets, Joints, and Fittings (20 Hours)**
- **Trainee $19**
- **Instructor $19**
  (Module ID 24105) Describes methods for joining PVC, ductile iron, and concrete pipe, including O-ring pipe, slip joints, mechanical joints, and restraint joints. Discusses methods for joining pipe to pipe, pipe to appurtenances, and pipe to manhole connections, including transition couplings.

**Introduction to Elevations (5 Hours)**
- **Trainee $19**
- **Instructor $19**
  (Module ID 24106) 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.

**Trench Safety (7.5 Hours)**
- **Trainee $19**
- **Instructor $19**
  (Module ID 24107) 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.

**Foundation Stabilization, Bedding, and Dewatering (7.5 Hours)**
- **Trainee $19**
- **Instructor $19**
  (Module ID 24108) Discusses 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.

**Testing Pipe (12.5 Hours)**
- **Trainee $19**
- **Instructor $19**
  (Module ID 24109) 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.

**Plumbing**

**LEVEL 1**

**Introduction to the Plumbing Profession (5 Hours)**
- **Trainee $19**
- **Instructor $19**
  (Module ID 02101-12) Introduces trainees to career options in the plumbing profession. Provides a history of plumbing and also discusses the current technology, industries, and associations of the plumbing profession. Also reviews human relations and safety skills.

**Plumbing Safety (22.5 Hours)**
- **Trainee $19**
- **Instructor $19**
  (Module ID 02102-12) Discusses the causes of accidents and their consequences including 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 including HazCom, safety signs, signals, lockout/tagout, and emergency response. Covers confined-space safety, and reviews safety issues related to hand and power tools.
Tools of the Plumbing Trade (10 Hours)
(Module ID 02103-12) Instructs trainees in the care and use of hand and power tools they will use on the job. Provides information needed to select the appropriate tools for different tasks, and reviews tool maintenance and safety issues.

Introduction to Plumbing Math (12.5 Hours)
(Module ID 02104-12) Reviews basic math concepts, such as whole numbers, fractions, decimals, and squares, and demonstrates how they apply to on-the-job situations. Explains how to measure pipe using fitting tables and framing squares and how to calculate 45-degree offsets.

Introduction to Plumbing Drawings (17.5 Hours)
(Module ID 02105-12) Introduces different types of plumbing drawings and discusses how to interpret and apply them when laying out and installing plumbing systems. Explains the symbols used in plumbing and mechanical drawings, and reviews isometric, oblique, orthographic, and schematic drawings. Requires trainees to render plumbing drawings and to recognize how code requirements apply to plumbing drawings.

Plastic Pipe and Fittings (12.5 Hours)
(Module ID 02106-12) Introduces 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 the manufacturer’s instructions and applicable codes. Also discusses pressure testing of plastic pipe once installed.

Copper Pipe and Fittings (12.5 Hours)
(Module ID 02107-12) 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.

Cast-Iron Pipe and Fittings (12.5 Hours)
(Module ID 02108-12) Introduces hub-and-spi-got and new 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.

Carbon Steel Pipe and Fittings (12.5 Hours)
(Module ID 02109-12) Discusses threading, labeling, and sizing of steel pipe and reviews the differences between domestic and imported pipe. Covers the proper techniques for measuring, cutting, threading, joining, and hanging steel pipe. Also reviews corrugated stainless steel tubing.

Introduction to Plumbing Fixtures (7.5 Hours)
(Module ID 02110-12) Discusses the proper applications of code-approved fixtures in plumbing installations. Reviews the different types of fixtures and the materials used in them. Also covers storage, handling, and code requirements.

Introduction to Drain, Waste, and Vent (DWV) Systems (10 Hours)
(Module ID 02111-12) 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.

Introduction to Water Distribution Systems (10 Hours)
Instructor $19  ISBN 978-0-13-292346-0
(Module ID 02112-12) 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.

Introduction to Water Supply Piping (20 Hours)
(Module ID 02113-12) Explains how to install water supply pipes and fittings, including hot and cold water service and distribution systems. Reviews materials, joints, and accessories and covers procedures for testing and isolating water supply systems.

Reading Commercial Drawings (20 Hours)
(Module ID 02202-13) Explains how to identify and interpret civil, architectural, structural, HVAC/mechanical, plumbing, and electrical drawings. Discusses how to ensure accurate dimensions, generate RFIs, and locate plumbing entry points, as well as how to establish piping routes and fixture locations. Isometric drawings, material takeoffs, approved submittal data, and Building Information Management (BIM), are also covered.

Structural Penetrations, Insulation, and Fire-Stopping (20 Hours)
(Module ID 02203-13) Introduces methods for adjusting structural members, insulating pipe, and installing fire-stopping. Covers reinforcement techniques for modified structural members; how to measure, cut, and install fiberglass and flexible foam insulation; and how to identify walls, floors, and ceilings that require fire-stopping.

Installing and Testing DWV Piping (25 Hours)
(Module ID 02204-13) Explains how to locate, install, connect, and test a complete drain, waste, and vent (DWV) system. Discusses how to develop material takeoffs, set up and use levels, locate building sewers and building drains, locate fixtures, and test a DWV system.

Installing Roof, Floor, and Area Drains (5 Hours)
(Module ID 02205-13) Covers the proper techniques for locating, installing, and connecting roof, floor, and area drains and floor sinks according to code. Also discusses waterproof membranes and flashing, drain components, shower pans, trap primers, and proper drain applications.

Types of Valves (5 Hours)
(Module ID 02207-13) Reviews types of valves, their components, and applications. Also covers valve servicing.

Installing and Testing Water Supply Piping (20 Hours)
(Module ID 02206-13) Explores the proper techniques for locating, installing, and testing complete water service and distribution systems, including meters, water heaters, water softeners, and hose bibbs. Introduces basic backflow and water hammer prevention, and discusses the installation of shower and tub valves, ice maker and washing machine boxes, and pipe stubouts and supports.

Installing Fixtures and Valves (20 Hours)
(Module ID 02208-13) Covers the installation of basic plumbing fixtures, including bathtubs, shower stalls, lavatories, sinks, water closets, and urinals. Reviews the installation of associated valves, faucets, and components. Also discusses how to connect appliances such as dishwashers, food-waste disposers, refrigerators and ice makers, and washing machines.

To Order Call: 1-800-922-0579 www.nccer.org/bookstore
Basic Electricity (10 Hours)
(Module ID 02210-13) Introduces electrical safety and the principles of electricity including voltage, current, resistance, and power. Includes important electrical formulas, circuitry, and common plumbing-related electrical applications.

Installing Water Heaters (10 Hours)
(Module ID 02209-13) Discusses gas-fired, electric, tankless, heat pump, and indirect water heaters, components, and applications. Reviews proper installation and testing techniques and covers the latest code requirements for water heaters.

Fuel Gas Systems (20 Hours)
(Module ID 02211-13) Introduces techniques for safe handling of natural gas, liquefied petroleum gas, and fuel oil. Reviews fuel gas and fuel oil safety precautions and potential hazards, applications, systems installation, and testing.

Sizing and Protecting the Water Supply System (30 Hours)
(Module ID 02312-14) Teaches techniques for sizing water supply systems, including calculating system requirements and demand, developed lengths, and pressure drops. Reviews the factors that can reduce efficiency of water supply piping. Introduces different backflow prevention devices and explains how they work, where they are used, and how they are installed in water supply systems.

Potable Water Supply Treatment (15 Hours)
(Module ID 02303-14) 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.

Types of Venting (20 Hours)
(Module ID 02305-14) Reviews the different types of vents that can be installed in a DWV system and explains how they work. Also teaches design and installation techniques.

Sizing DWV and Storm Systems (20 Hours)
(Module ID 02306-14) 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.

Sewage Pumps and Sump Pumps (12.5 Hours)
(Module ID 02307-14) Discusses the installation, diagnosis, and repair of pumps, controls, and sumps in sewage and storm water removal systems.

Corrosive-Resistant Waste Piping (7.5 Hours)
(Module ID 02308-14) 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.

Compressed Air (10 Hours)
(Module ID 02309-14) Explains the principles of compressed air systems and describes their components and accessories. Reviews installation and periodic servicing of air compressor systems.

Service Plumbing (27.5 Hours)
(Module ID 02311-14) Covers the troubleshooting and repair of fixtures, valves, and faucets in accordance with code and safety guidelines. 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.

Water Pressure Booster and Recirculation Systems (17.5 Hours)
(Module ID 02401-06) Introduces 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.

Introductory Skills for the Crew Leader (16 Hours)
(Module ID 02402-06) 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.

To Order Call: 1-800-922-0579  Stay Connected  www.nccer.org/bookstore
Plumbing Level 4 (continued)

Indirect and Special Waste (12.5 Hours)
(Module ID 02404-06) Explains the code requirements and installation procedures for systems that protect against contamination from indirect and special wastes.

Hydronic and Solar Heating Systems (15 Hours)
(Module ID 02405-06) Introduces basic 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.

Codes (7.5 Hours)
(Module ID 02406-06) Discusses the different codes used by plumbers across the country and explains how those codes are written, adapted, modified, and implemented.

Servicing Piping Systems, Fixtures, and Appliances (22.5 Hours)
(Module ID 02407-06) 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.

Private Water Supply Well Systems (10 Hours)
(Module ID 02408-06) Explains the operation of pumps and well components. Reviews the qualities of good wells and how to assemble and disassemble pumps and components.

Private Waste Disposal Systems (10 Hours)
(Module ID 02409-06) 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.

Private Waste Disposal Systems (15 Hours)
(Module ID 02410-06) Introduces plumbing systems in swimming pools, hot tubs, and spas. Trainees will learn how to install and troubleshoot water supply systems and drains.

Plumbing for Mobile Homes and Travel Trailers (10 Hours)
(Module ID 02411-06) Describes the location and layout of plumbing systems for mobile home and travel trailer parks. Explains 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.

Ordering information for Plumbing Level 4, Fourth Edition, due in stock Fall 2014:

Reinforcing Ironwork

L1 REINFORCING IRONWORK
LEVEL 1

Curriculum Notes
• 117.5 Hours
• Published: 2005
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.
• A Spanish translation is available. Please see NCCER’s online catalog for more information.

PAPERBACK  ISBN
Traine Guide: $67  978-0-13-228220-8

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.

Concrete Reinforcement (40 Hours)
(Module ID 39101-05) Describes the selection and use of rebar, bar supports, and welded-wire fabric. Presents general procedures for cutting, bending, splicing, and tying rebar, and placement of steel in various types of footings, columns, walls, and slabs.

Concrete Reinforcement Safety (15 Hours)
(Module ID 39102-05) 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.

Rigging Equipment (10 Hours)
(Module ID 39103-05) 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.

Rigging Practices (15 Hours)
(Module ID 39104-05) 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.

Commercial Blueprints (20 Hours)
(Module ID 39105-05) Explains the format and content of drawings typically found in a commercial drawings package.

Oxyfuel Cutting (17.5 Hours)
(Module ID 39106-05) Explains the safety requirements for oxyfuel cutting. Identifies equipment and setup requirements and explains how to light, adjust, and shut down oxyfuel equipment. Explains how to perform cutting techniques that include straight line, piercing, bevels, washing, and gouging.

Swimming Pools and Hot Tubs (10 Hours)
(Module ID 02410-06) Introduces plumbing systems in swimming pools, hot tubs, and spas. Trainees will learn how to install and troubleshoot water supply systems and drains.

L2 REINFORCING IRONWORK
LEVEL 2

Curriculum Notes
• 100 Hours
• Published: 2005
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK  ISBN
Traine Guide: $94  978-0-13-227794-0
Instructor’s Guide: $94  978-0-13-227795-7

Product Supplements
PowerPoint® Presentation Slides

MODULES
Reinforcing Ironwork Level Two is comprised of modules from NCCER’s Carpentry and Ironworking Curricula. 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.

Foundations and Flatwork (15 Hours)
(Module ID 27204-01) Covers the construction of forms for continuous, stepped continuous, pier and grade beam concrete footings. Describes the edge forms used for on-grade concrete footings, slabs and similar structures. Forming terms, parts of forms and procedures for constructing basic footing and edge forms are included.

To Order Call: 1-800-922-0579  Stay Connected:  www.nccer.org/bookstore
Concrete Forms (32.5 Hours)
(Module ID 27207-01) Covers the tools, equipment and procedures required for handling, placing, and finishing concrete at the job site. Describes joints made in concrete structures, the use of joint sealants, and form removal procedures. Safety procedures for handling, placing, and finishing concrete are emphasized.

Manufactured Forms (22.5 Hours)
(Module ID 38102-11) Describes basic rigging and crane operation. Covers procedures for using slings and rigging pipes as well as inspection requirements and procedures for using wire rope, load charts, determining the center of gravity of a load, and using cranes to lift personnel. Discusses basic principles associated with mobile crane operation. Also includes an in-depth discussion of terminology and nomenclature.

Metal Decking (10 Hours)
Instructor $19  ISBN 978-0-13-015446-0
(Module ID 38101-11) Describes basic rigging and crane operation. Covers procedures for using slings and rigging pipes as well as inspection requirements and procedures for using wire rope, load charts, determining the center of gravity of a load, and using cranes to lift personnel. Discusses basic principles associated with mobile crane operation. Also includes an in-depth discussion of terminology and nomenclature.

Rigger/Signal Person

Basic Rigging (15 Hours)
(Module ID 00106-09; from Core Curriculum)
Instructor $19  ISBN 978-0-13-266200-0

Intermediate Rigging (10 Hours)
Instructor $19  ISBN 978-0-13-266187-4
(Module ID 38203-11) Provides step-by-step instructions for the assembly and disassembly of long and short lattice booms as well as the extension and stowing of swing-away lattice booms for telescopic booms. Covers the installation and stowing of A-frame jibs.

Basic Principles of Cranes (15 Hours)
(Module ID 38204-11) Introduces mobile crane equipment with an in-depth discussion of terminology and nomenclature. Explains the basic scientific principles associated with mobile crane operation.

Boom Assembly and Disassembly (20 Hours)
Instructor $19  ISBN 978-0-13-266187-4
(Module ID 38201-11) Describes the basic procedures for using the various types of slings and for determining sling stress. Introduces lift plans, crane load charts, determining the center of gravity of a load, and using cranes to lift personnel. Describes sling selection and the use of jacks, hoists, and rollers to move loads.

Rigging Practices (15 Hours)
(Module ID 38102-11) Describes basic rigging and crane hazards as well as safety practices related to general rigging activities, working around power lines, and emergency response. Covers procedures for using slings and rigging pipes and valves.

Intermediate Rigging (10 Hours)
(Module ID 38203-11) Provides step-by-step instructions for the assembly and disassembly of long and short lattice booms as well as the extension and stowing of swing-away lattice booms for telescopic booms. Covers the installation and stowing of A-frame jibs.

Basic Principles of Cranes (15 Hours)
(Module ID 38204-11) Introduces mobile crane equipment with an in-depth discussion of terminology and nomenclature. Explains the basic scientific principles associated with mobile crane operation.
Rigger/Signal Person (continued)

**ADVANCED RIGGER**

<table>
<thead>
<tr>
<th><strong>Curriculum Notes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• 65 Hours</td>
</tr>
<tr>
<td>• Published: 2011</td>
</tr>
<tr>
<td>• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from <a href="http://www.nccerirc.com">www.nccerirc.com</a>.</td>
</tr>
</tbody>
</table>

**PAPERBACK**  
ISBN  
Trainee Guide: $49  978-0-13-215461-1  
Instructor’s Guide: $49  978-0-13-215462-8

**Product Supplements**  
PowerPoint® Presentation Slides  
(includes slides for Basic, Intermediate, and Advanced on one CD)

**MODULAS**  
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.

**Advanced Rigging** (20 Hours)  
(Module ID 38301-11) Explains how the load weight and center of gravity affect a lift. Covers sling selection and spreader bar use, as well as the use of cribbing and inclined planes. Includes case studies from three complex lifts.

**SIGNAL PERSON**

<table>
<thead>
<tr>
<th><strong>Curriculum Notes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• 40 Hours</td>
</tr>
<tr>
<td>• Published: 2011</td>
</tr>
<tr>
<td>• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from <a href="http://www.nccerirc.com">www.nccerirc.com</a>.</td>
</tr>
</tbody>
</table>

**PAPERBACK**  
ISBN  
Instructor’s Guide: $49  978-0-13-215455-0

**Scaffolding**

<table>
<thead>
<tr>
<th><strong>Curriculum Notes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• 145 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)</td>
</tr>
<tr>
<td>• Published: 1999</td>
</tr>
<tr>
<td>• A full color revision is underway and due in stock late 2014.</td>
</tr>
<tr>
<td>• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from <a href="http://www.nccerirc.com">www.nccerirc.com</a>.</td>
</tr>
<tr>
<td>• A Spanish translation of the first edition is available. Please see NCCER’s online catalog for more information.</td>
</tr>
</tbody>
</table>

**PAPERBACK**  
ISBN  

**MODULAS**  
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.

**Introduction to the Trade** (5 Hours)  
(Module ID 31101) Introduces the scaffolding program, describes the duties of a scaffold er, and identifies scaffold types and scaffolding terms.

**Trade Safety** (7.5 Hours)  
(Module ID 31102) Provides a comprehensive overview of the safety regulations and guidelines in the scaffolding industry.

**Trade Tools and Equipment** (7.5 Hours)  
(Module ID 31103) Covers the safe use and applications of hand and power tools used in the trade.

**Trade Math** (7.5 Hours)  
(Module ID 31104) Explains and gives examples of math calculations of scaffold loads, including area loads, concentrated loads, live loads, cantilevered loads, and wind loads.

**Stationary Scaffolds** (27.5 Hours)  
(Module ID 31105) Identifies the equipment used with stationary scaffolds. Describes the procedures for erecting stationary scaffolds.

**Mobile Scaffolds** (10 Hours)  
(Module ID 31106) Identifies the different types of powered and manually propelled mobile scaffolds and describes their erection and operation.

**Suspension Scaffolds** (7.5 Hours)  
(Module ID 31107) Identifies the types of equipment used with suspension scaffolds. Describes the rigging of suspension scaffolds.

**Lift Planning** (40 Hours)  
(Module ID 38302-11) Provides an in-depth look at the development of a lift plan. Topics include reference information, load calculations, planning for multiple-crane lifts, engineering considerations, and application of load charts.

**Personnel Lifts** (5 Hours)  
(Module ID 38303-11) 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.

**Basic Principles of Cranes** (15 Hours)  
(train Mode I 38204-11; from Intermediate Rigging)  
Crate Safety (5 Hours)  
(Module ID 21104-04; from Mobile Crane Operations Level One)  

**Product Supplements**  
PowerPoint® Presentation Slides  
ISBN 978-0-13-015455-0  $40

**Scaffolding** Ordering information for Scaffolding, Second Edition, due in stock Fall 2014:

**PAPERBACK**  
ISBN  
Trainee Guide: $67  978-0-13-383081-1  
Instructor’s Guide: $67  978-0-13-383541-0
Sheet Metal

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 module completions through NCCER-accredited training providers for the continuing education hours required for recertification through NATE. For details and lists of available NATE-recognized training, visit www.natax.org. For more information regarding NATE recertification, please contact NCCER Customer Service at 1-888-622-3720.

Fabrication One – Parallel Line Development (22.5 Hours)
(Module ID 04105-08) Covers the steps involved in using the parallel line development method to lay out fittings and includes step-by-step procedures for selected fittings.

Installation of Ductwork (15 Hours)
(Module ID 04106-08) Addresses ductwork assembly, use of different types of sealants, using lifts, and installation of ductwork. Describes the types of fasteners (screws, nuts, bolts, rivets), and supports used in an air distribution system. Discusses proper spacing of hangers, load ratings, and installation of hangers and support systems.

Insulation (7.5 Hours)
(Module ID 04107-08) 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.

Architectural Sheet Metal (15 Hours)
(Module ID 04109-08) Teaches how to lay out and fabricate sheet metal components of a roof drainage system, including flashing, gutters, and downspouts.

Product Supplements

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.

Introduction to the Sheet Metal Trade (5 Hours)
(Module ID 04101-08) Summarizes the history and development of the sheet metal trade. Explains the benefits of apprenticeship training, and identifies career opportunities in the trade.

Tools of the Trade (5 Hours)
(Module ID 04102-08) 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.

Introduction to Sheet Metal Layout and Processes (7.5 Hours)
(Module ID 04103-08) 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.

Trade Math One (20 Hours)
(Module ID 04104-08) 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.

N1 SHEET METAL
LEVEL 1

Curriculum Notes
• 175 Hours (Includes 72.5 hours for Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
• Revised: 2008, Third Edition
• Includes full color insert
• NATE Recognized Training Provider
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

Trainee Guide: $67
Instructor’s Guide: $67


MODULES
Stay Connected: 1-800-922-0579 www.nccer.org/bookstore
Bend Allowances  (5 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04206-08) Provides instruction and practice in determining proper bend allowances in sheet metal. Also reviews the interplay of different factors that affect the amount of bend allowance needed and the methods for calculating allowance.  

Soldering  (15 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04206-08) Provides instruction and practice in soldering basic piping practices. Explains how to repair major and minor fabrication methods. Also discusses closure, hanging, and joining selected types of pipe using fittings, hangers, and supports. Also reviews pipe materials and applications.  

Fiberglass Duct  (20 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04207-08) Identifies soldering tools, materials, and techniques. Also provides a wide range of soldering tasks for practice.  

Basic Piping Practices  (7.5 Hours)  
Trainee  $19  
Instructor  $19  
ISBN 978-0-13-609939-0  
(Module ID 04208-08) Reviews the methods for measuring, cutting, and joining selected types of pipe using fittings, hangers, and supports. Also reviews pipe materials and applications.  

Sheet Metal Level 2 (continued)  

Air Systems  (10 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04302-09) Reviews the operating principles, components, and applications of common air systems. Discusses constant volume systems, variable volume systems, variable temperature (VVT) systems, variable air volume (VAV) systems, and dual VAV systems.  

Principles of Airflow  (22.5 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04303-09) 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.  

Louvered, Dampers, and Access Doors  (20 Hours)  
Trainee  $19  
Instructor  $19  
ISBN 978-0-13-610522-0  
(Module ID 04304-09) Discusses the different types of louvers, dampers, and access doors used in air distribution systems and reviews the standards that apply to them.  

Comprehensive Plan and Specification Reading  (30 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04305-09) 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 construction drawings.  

Fabrication Three – Triangulation  (47.5 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04306-09) Describes the principles of triangulation and how it can be used to measure ductrun fittings. Provides a variety of tasks to practice developing, laying out, and fabricating selected ductrun fittings.  

Advanced Architectural Sheet Metal  (12.5 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04307-09) Provides trainees the opportunity to practice layout, fabrication, and installation of various architectural pieces.  

Fume and Exhaust System Design  (25 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04403-09) Introduces the techniques and proper operation of equipment used for welding, brazing, and cutting. Emphasizes safety and awareness of hazards involved. Trainees practice welds in a variety of positions and perform a basic breeze.  

Furnace and Exhaust System Design  (25 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04403-09) Introduces the techniques and proper operation of equipment used for welding, brazing, and cutting. Emphasizes safety and awareness of hazards involved. Trainees practice welds in a variety of positions and perform a basic breeze.  

Fabrication Four – Comprehensive Review  (40 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04405-09) Provides a review of parallel line, radial line, and triangulation development methods for laying out sheet metal patterns. Trainees practice laying out and fabricating selected sheet metal fittings using these methods.  

Introductory Supervisory Skills  (20 Hours)  
Trainee  $19  
Instructor  $19  
ISBN 978-0-13-214238-0  
(Module ID 04406-09) Teaches skills required to supervise personnel, including leadership, team building, communication and motivation. Discusses gender and cultural issues. Emphasizes principles of project planning and management, including problem solving and decision making. Presents case studies for student participation.  

L3 SHEET METAL  

Curriculum Notes  
- 157.5 Hours  
- Revised: 2009, Third Edition  
- NATE-Recognized Training Provider  
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.  

PAPERBACK  
Trainee Guide: $94  
Instructor Guide: $94  
978-0-13-609962-8  
978-0-13-609963-5  

Product Supplements  
PowerPoint® Presentation Slides (in color)  
$40  

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.  

Shop Production and Organization  (15 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04401-09) Introduces the production, organization, planning, and control functions that occur in a sheet metal shop. Emphasizes optimization of processes and accurate estimating for competitive bidding. Discusses project planning techniques, principles of efficient shop layout and materials flow, the critical path method, and the roles and relationships of shop personnel.  

Air Testing and Balancing  (25 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04402-09) Explains how to balance an air distribution system 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. Provides proper techniques for duct leakage testing.  

Introduction to Welding, Brazing and Cutting  (25 Hours)  
Trainee  $19  
Instructor  $19  
(Module ID 04403-09) Introduces the techniques and proper operation of equipment used for welding, brazing, and cutting. Emphasizes safety and awareness of hazards involved. Trainees practice welds in a variety of positions and perform a basic breeze.  

L4 SHEET METAL  

Curriculum Notes  
- 150 Hours  
- Revised: 2009, Third Edition  
- NATE-Recognized Training Provider  
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.  

PAPERBACK  
Trainee Guide: $94  
Instructor Guide: $94  
978-0-13-609964-2  
978-0-13-609965-9  

Product Supplements  
PowerPoint® Presentation Slides  
ISBN 978-0-13-214184-0  
$40
SITE LAYOUT

LEVEL 1

162.5 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)

Published: 2004

Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK ISBN
Trainee Guide: $67 978-0-13-109883-1
Instructor Guide: $67 978-0-13-109888-6

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.

Introduction to Site Layout (10 Hours)
(Module ID 78101-04) 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.

Surveying Math (30 Hours)
(Module ID 78102-04) Expands upon Introduction to Construction Math, with emphasis 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 basic geometry and right-angle trigonometry.

Survey Equipment Use and Care One (30 Hours)
(Module ID 78103-04) 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.

Blueprint Reading for Surveyors (20 Hours)
(Module ID 78104-04) Expands upon Introduction to Construction Drawings, with the techniques for reading and using blueprints and specifications, with an emphasis placed on drawings and types of information that are relevant to the site layout trade.

L2 SITE LAYOUT

LEVEL 2

145 Hours

Published: 2004

Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK ISBN
Trainee Guide: $94 978-0-13-109176-4
Instructor Guide: $94 978-0-13-109177-1

Curriculum Notes

- 145 Hours
- Published: 2004
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

Concrete Properties and Quality Control (15 Hours)
(Module ID 78206-04) 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.

Survey Equipment Use and Care Two, EDMs and Total Stations (10 Hours)
(Module ID 78202-04) Covers the setup, use, calibration, and care of electronic distance measuring instruments and total stations.

Control Setup (30 Hours)
(Module ID 78203-04) 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.

Boundary and Topography Surveys (10 Hours)
(Module ID 78204-04) 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.

Data Collection and Basic Computer Skills (10 Hours)
(Module ID 78205-04) 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.

Means and Methods (40 Hours)
(Module ID 78207-04) 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, embeddings, and stairs.
## Sprinkler Fitting

<table>
<thead>
<tr>
<th>Level</th>
<th>Modules</th>
<th>ISBN</th>
<th>Description</th>
</tr>
</thead>
</table>
| **L1** | Sprinkler Fitting | 978-0-13-380317-4 | CURRICULUM NOTES:  
- 145 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)  
- Revised: 2013, Third Edition to reflect NFPA 13  
- Trainee Guide and trainee modules are in full color.  
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com. |

### CPVC Pipe and Fittings (10 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18104-13) Describes handling and storage 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.

### Copper Tube Systems (10 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18105-13) Introduces copper tubing and fittings along with cutting and bending tools. Describes the soldering process and techniques for measuring, cutting, reaming, and cleaning. Brazing is described as are brazing metals, fluxes, and brazing equipment. Support bracing for copper tube and grooved couplings for copper pipe are also discussed.

### Underground Pipe (17.5 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18106-13) Details underground piping installations for various types of pipe. Explains thrust blocks and restraints. In-building risers, hydrants, yard valves, and hydrant houses are discussed as are testing, inspection, flushing, and chlorinating.

### Underground Test Certificate (7.5 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18107-13) 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; fault pressure gauges; inspector’s test connections and auxiliary drains; and hydrostatic testing and test pumps.

### Standard Spray Fire Sprinklers (20 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18201-13) Reviews math principles used to solve everyday problems, including unit conversion from the English system to the metric system and vice versa. Includes sprinkler fitting problems such as calculating 45-degree offsets and tank volume, centering sprinkler heads using geometric methods, and problems relating to hanger sizing.

### Dry-Pipe Systems (25 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18203-13) Describes how to install pressure gauges on alarm valves and troubleshoot dry-pipe systems. Also covers installation of OS&Y valves, butterfly grooved valves, and tamper switches. Outlines procedures for disassembling, servicing, and reassembling check valves.

### General Purpose Valves (15 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18202-13) Covers types of valves and valve applications, 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.

### General Trade Math (20 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18203-13) Reviews math principles used to solve everyday problems, including unit conversion from the English system to the metric system and vice versa. Includes sprinkler fitting problems such as calculating 45-degree offsets and tank volume, centering sprinkler heads using geometric methods, and problems relating to hanger sizing.

### Shop Drawings (32.5 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18204-13) Explains 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.

### Shop Drawings (32.5 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18204-13) Explains 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.

## Level 2

<table>
<thead>
<tr>
<th>Curriculum Notes</th>
<th>ISBN</th>
<th>Description</th>
</tr>
</thead>
</table>
| REVISED!         | PAPERBACK | 978-0-13-380290-0 | 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.  
- **Orientation to the Trade** (5 Hours)  
- **Introduction to Components and Systems** (7.5 Hours)  
- **Steel Pipe** (22.5 Hours)  
- **Hangers, Supports, Restraints, and Guides** (15 Hours)  
- **General Purpose Valves** (15 Hours)  
- **General Trade Math** (20 Hours)  
- **Shop Drawings** (32.5 Hours)  
- **Standard Spray Fire Sprinklers** (20 Hours)  
- **Dry-Pipe Systems** (25 Hours)  |

### Steel Pipe (22.5 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18103-13) 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.

### Hangers, Supports, Restraints, and Guides (15 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18201-13) Identifies strength-spacing requirements, types, and installation of pipe hangers, supports, restraints, and guides. Covers types and installation of earthquake bracing and explains sloeving and fire-stopping.

### General Purpose Valves (15 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18202-13) Covers types of valves and valve applications, 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.

### General Trade Math (20 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18203-13) Reviews math principles used to solve everyday problems, including unit conversion from the English system to the metric system and vice versa. Includes sprinkler fitting problems such as calculating 45-degree offsets and tank volume, centering sprinkler heads using geometric methods, and problems relating to hanger sizing.

### Shop Drawings (32.5 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18204-13) Explains 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.

### Standard Spray Fire Sprinklers (20 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18204-13) Explains 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.

### Dry-Pipe Systems (25 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18207-13) Explains the purpose, function, and operation of dry-pipe system components. Describes 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.

## Level 3

<table>
<thead>
<tr>
<th>Curriculum Notes</th>
<th>ISBN</th>
<th>Description</th>
</tr>
</thead>
</table>
| REVISED!         | PAPERBACK | 978-0-13-383079-8 | 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.  
- **Orientation to the Trade** (5 Hours)  
- **Introduction to Components and Systems** (7.5 Hours)  
- **Steel Pipe** (22.5 Hours)  
- **Hangers, Supports, Restraints, and Guides** (15 Hours)  
- **General Purpose Valves** (15 Hours)  
- **General Trade Math** (20 Hours)  
- **Shop Drawings** (32.5 Hours)  
- **Standard Spray Fire Sprinklers** (20 Hours)  
- **Dry-Pipe Systems** (25 Hours)  |

### Steel Pipe (22.5 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18103-13) 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.

### Hangers, Supports, Restraints, and Guides (15 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18201-13) Identifies strength-spacing requirements, types, and installation of pipe hangers, supports, restraints, and guides. Covers types and installation of earthquake bracing and explains sloeving and fire-stopping.

### General Purpose Valves (15 Hours)
- Trainee $19  
- Instructor $19  
- (Module ID 18202-13) Covers types of valves and valve applications, 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.
Sprinkler Fitting Level 3 (continued)

Module 18305-13 Describes deluge and preaction systems and FireCycle® Systems.

Module 18304-13 Covers fire pump categories and properties. Discusses methods of determining water supply capability, water supply appurtenances, fire department connections, and typical city water pipes.

Module 18303-13 Covers standpipe classifications and explains flow capabilities of each type. Covers requirements for sizing and installation of standpipes. Discusses pressure-reducing valves under flow and no-flow conditions. Also covers LINK-SEAL™ installations.

Module 18302-13 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 pipes.


L4 SPRINKLER FITTING

Curriculum Notes

• 145 Hours
• Revised: 2013, Third Edition to reflect NFPA 13
• Trainee Guide and trainee modules are in full color.
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK

Trainee Guide: $90
Instructor’s Guide: $90

Product Supplements

PowerPoint® Presentation Slides
ISBN 978-0-13-383543-4
$40

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.

Inspection, Testing, and Maintenance

(17.5 Hours)

Trainee $19
Instructor $19

(Module ID 18402-13) Describes 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.

Special Extinguishing Systems

(42.5 Hours)

Trainee $19
Instructor $19

(Module ID 18403-13) Identifies 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.

Introductory Skills for the Foreman

(20 Hours)

Trainee $19
Instructor $19

(Module ID 18404-13) Introduces the role of foremanship and covers responsibilities, leadership, and safety. Also explains project documentation and reports related to materials tracking and labor tracking.

Procedures and Documentation

(20 Hours)

Trainee $19
Instructor $19

(Module ID 18405-13) 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 case history of an unintentional release.

Tower Crane Operator

L1 TOWER CRANE OPERATOR

Curriculum Notes

• 177.5 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
• Published: 2010
• Includes full color insert

PAPERBACK

Trainee Guide: $67
ISBN 978-0-13-213720-1
Instructor’s Guide: $67

Product Supplements

PowerPoint® Presentation Slides
$40

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.

Orientation to the Trade

(5 Hours)

Trainee $19
Instructor $19

(Module ID 48101-10) Provides an overview of the tower crane industry and highlights the duties and responsibilities of a tower crane operator. Discusses ASME and OSHA standards, as well as career opportunities and operator requirements.

To Order Call: 1-800-922-0579
www.nccer.org/bookstore
Basic Principles of Tower Cranes (20 Hours)
Trainee $19
Instructor $19
(Module ID 48102-10) Identifies the three main types of tower cranes and their components, including operator aids and base support systems. Explains the basic scientific principles associated with tower crane operation. Discusses the factors that affect lifting capacities.

Tower Crane Safety (15 Hours)
Trainee $19
Instructor $19
(Module ID 48103-10) Introduces various safety aspects of tower crane operation, including equipment inspection, rigging, swing paths, and site hazard identification.

Rigging Practices (15 Hours)
Trainee $19
Instructor $19
(Module ID 48104-10) Describes the use and inspection of basic equipment and hardware used in rigging, including slings, wire rope, chains, lifting beams, and attaching hardware such as shackles, eyebolts, and hooks. Explains sling capacities and sling angles.

Load Charts (15 Hours)
Trainee $19
Instructor $19
(Module ID 48105-10) Explains how to use load charts to calculate safe lifting capacities for self-erecting, luffing boom, and hammerhead tower cranes. Also covers parts of line and counterweight configurations.

Communications (10 Hours)
Trainee $19
Instructor $19
(Module ID 48106-10) Covers the fundamentals of the communication process, including verbal and nonverbal methods of communication. Also presents the ASME B30.3 hand signals, including the appropriate operator action when the signal is given.

Operating a Tower Crane (25 Hours)
Trainee $19
Instructor $19
(Module ID 48107-10) Describes the basic functions of a tower crane, as well as standard procedures for starting up and shutting down self-erecting, luffing boom, and hammerhead tower cranes. Provides an opportunity for trainees to become familiar with the actual operation of a tower crane and the functions of its controls.

---

Welding

Welding Safety (2.5 Hours)
Trainee $19
Instructor $19
(Module ID 29101-09) Discusses safety equipment, protective clothing, and procedures applicable to the cutting and welding of metals.

Oxyfuel Cutting (17.5 Hours)
Trainee $19
Instructor $19
(Module ID 29102-09) Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and setup requirements. Explains how to light, adjust, and shut down oxyfuel equipment.

Plasma Arc Cutting (7.5 Hours)
Trainee $19
Instructor $19
(Module ID 29103-09) Introduces 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.

Air Carbon Arc Cutting and Gouging (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 29104-09) Introduces 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 cutting and gouging activities.

Base Metal Preparation (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 29105-09) 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.
Preheating and Postheating of Metals (5 Hours)

Instructor S19

Module ID 29209-09 Presents 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 treating metals.

GMAW and FCAW – Equipment and Filler Metals (10 Hours)

Instructor S19

Module ID 29206-09 Explains how to set up and use GMAW and FCAW equipment and how to select and use different filler metals and shielding gases. Describes how to estimate multiple-pass fillet and V-groove welds on carbon steel plate in various positions.

GTAW – Equipment and Filler Materials (10 Hours)

Instructor S19

Module ID 29207-09 Describes GTAW equipment, filler metals, and shielding gases. Covers the setup of GTAW equipment and addresses safety concerns.

GTAW Plate (60 Hours)

Instructor S19


LEVEL 3 WELDING

Curriculum Notes
- 470 Hours (370 required; 100 Elective/Optional)
- Revised: 2010, Fourth Edition
- Prepared in cooperation with AWS and supports learning objectives from the AWS Advanced & Expert Welder Programs.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK ISBN
Trainee Guide: $94
978-0-13-213511-5
Instructor’s Guide: $94
978-0-13-213512-2

NCCERconnect (See p. 7 for details) ISBN
For instructor access only, contact your Pearson Representative.
978-0-13-301641-3
IG Paperback + Access Card Package: $94
978-0-13-301640-6

Weld Quality (10 Hours)

Trainee S19
Instructor S19

(Module ID 29106-09) Identifies the codes that govern welding, including marine welds. Identifies and explains weld imperfections and causes. Describes non-destructive testing, visual inspection criteria, welder qualification tests, and the importance of quality workmanship.

SMAW – Equipment and Setup (5 Hours)

Trainee S19
Instructor S19

(Module ID 29107-09) Describes SMAW welding and welding safety. Explains how to connect welding current and set up arc welding equipment. Also explains how to use tools for cleaning welds.

SMAW – Beads and Fillet Welds (120 Hours)

Trainee S19
Instructor S19
ISBN 978-0-13-610548-0

(Module ID 29108-09) Describes electrode characteristics and different types of filler metals. Reviews 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.

Joint Fit-Up and Alignment (5 Hours)

Trainee S19
Instructor S19

(Module ID 29110-09) Describes job code specifications. Explains how to use fit-up gauges and measuring devices to check fit-up and alignment and use plate and pipe fit-up and alignment tools to properly prepare joints. Explains how to check for joint misalignment and poor fit.

SMAW – Groove Welds with Backing (30 Hours)

Trainee S19
Instructor S19

(Module ID 29111-09) Introduces groove welds and explains 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.

SMAW – Open V-Groove Welds (80 Hours)

Trainee S19
Instructor S19

(Module ID 29112-09) Introduces open V-groove welds and explains 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.

L2 WELDING

Curriculum Notes
- 187.5 Hours
- Revised: 2009, Fourth Edition
- Sequenced in accordance with the American Welding Society’s (AWS) S.E.W.E. school requirements. When combined with Welding Level 1, the content complies with all learning objectives specified in AWS E62.95, Entry-Level Welder.

Module Guide and individual trainee modules are full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK ISBN
Trainee Guide: $94
978-0-13-609970-3
Instructor’s Guide: $94
978-0-13-609972-7

NCCERconnect (See p. 7 for details) ISBN
For instructor access only, contact your Pearson Representative.
978-0-13-286595-1
IG Paperback + Access Card Package: $94
978-0-13-286594-4

(does not include print book)
978-0-13-285924-0

(does not include print book)
978-0-13-292172-5

PowerPoint® Presentation Slides
$40

Welding Levels 1-4 Performance Labs
$25

ALL OF THE MODULES LISTED BELOW ARE INCLUDED IN THE TRAINEE AND INSTRUCTOR GUIDES LISTED ABOVE. THE FOLLOWING ISBN AND PRICING INFORMATION IS FOR ORDERING INDIVIDUAL MODULES ONLY.

Welding Symbols (5 Hours)

Trainee S19
Instructor S19

(Module ID 29201-09) Identifies different fillet weld, groove weld, and non-destructive examination symbols. Explains how to read welding symbols on drawings, specifications and Welding Procedure Specifications (WPS) sheets.

Reading Welding Detail Drawings (10 Hours)

Trainee S19
Instructor S19

(Module ID 29202-09) Provides an overview of welding detail drawings. Describes lines, fills, object views, and dimensioning on drawings. Explains how to use notes on drawings and the bill of materials. Also teaches how to sketch and draw basic welding drawings.

Physical Characteristics and Mechanical Properties of Metals (7.5 Hours)

Trainee S19
Instructor S19

(Module ID 29203-09) Explains physical characteristics, mechanical properties, composition, and classification of common ferrous and nonferrous metals. Identifies standard metal forms and structural shapes. Shows how to extract metal information from Welding Procedure Specification (WPS) sheets and Procedure Qualification Records (PQRs). Covers visual inspection, magnetic testing, and X-ray fluorescent spectrometry methods used to identify metals.
GTAW – Low Alloy and Stainless Steel Pipe
(70 Hours)
Trainee $19
Instructor $19
(Module ID 29305-10) Explains how to set up GTAW equipment for open-root V-groove welds on low-alloy and stainless steel pipe, and explains how to prepare for and make open-root V-groove welds on low-alloy and stainless steel pipe. Provides procedures for making open-root V-groove welds with GTAW equipment on low-alloy and stainless steel pipe in the 2G, 6G, and 66 positions.

SMAW: Stainless Steel Groove Welds
(100 Elective Hours)
Trainee $19
Instructor $19
(Module ID 29306-10) Explains stainless steel metallurgy; how to select SMAW electrodes for stainless steel welds; and how to prepare weld coupons; and how to set up SMAW equipment for welding stainless steel. Provides procedures for making open-root V-groove welds with SMAW equipment on stainless steel pipe in the 1G-ROTATED, 2G, 6G, and 66 positions. Includes procedures for making open-root V-groove welds with SMAW equipment on pipe in the 1G-ROTATED, 2G, 6G, and 66 positions.

GMAW – Pipe (60 Hours)
Trainee $19
Instructor $19
(Module ID 29302-10) Explains how to set up GMAW equipment for open-root V-groove welds, and explains how to prepare for and make open-root V-groove welds on carbon steel pipe. Provides procedures for making open-root V-groove welds with GMAW equipment on pipe in the 1G-ROTATED, 2G, 6G, and 66 positions.

FCAW – Pipe (60 Hours)
Trainee $19
Instructor $19
(Module ID 29303-10) Explains how to set up FCAW equipment for open-root V-groove welds, and explains how to prepare for and make open-root V-groove welds on carbon steel pipe. Provides procedures for making open-root V-groove welds with FCAW equipment on pipe in the 1G-ROTATED, 2G, 6G, and 66 positions.

GTAW – Carbon Steel Pipe (80 Hours)
Trainee $19
Instructor $19
(Module ID 29304-10) Explains how to set up GTAW equipment for open-root V-groove welds, and explains how to prepare for and make open-root V-groove welds on carbon steel pipe. Provides procedures for making open-root V-groove welds with GTAW equipment on pipe in the 2G, 6G, and 66 positions.

GTAW – Low Alloy and Stainless Steel Pipe
(70 Hours)
Trainee $19
Instructor $19
(Module ID 29305-10) Explains how to set up GTAW equipment for open-root V-groove welds on low-alloy and stainless steel pipe, and explains how to prepare for and make open-root V-groove welds on low-alloy and stainless steel pipe. Provides procedures for making open-root V-groove welds with GTAW equipment on low-alloy and stainless steel pipe in the 2G, 6G, and 66 positions.

SMAW: Stainless Steel Groove Welds
(100 Elective Hours)
Trainee $19
Instructor $19
(Module ID 29306-10) Explains stainless steel metallurgy; how to select SMAW electrodes for stainless steel welds; and how to prepare weld coupons; and how to set up SMAW equipment for welding stainless steel. Provides procedures for making open-root V-groove welds with SMAW equipment on stainless steel pipe in the 1G-ROTATED, 2G, 6G, and 66 positions. Includes procedures for making open-root V-groove welds with SMAW equipment on pipe in the 1G-ROTATED, 2G, 6G, and 66 positions.

GMAW – Pipe (60 Hours)
Trainee $19
Instructor $19
(Module ID 29302-10) Explains how to set up GMAW equipment for open-root V-groove welds, and explains how to prepare for and make open-root V-groove welds on carbon steel pipe. Provides procedures for making open-root V-groove welds with GMAW equipment on pipe in the 1G-ROTATED, 2G, 6G, and 66 positions.

FCAW – Pipe (60 Hours)
Trainee $19
Instructor $19
(Module ID 29303-10) Explains how to set up FCAW equipment for open-root V-groove welds, and explains how to prepare for and make open-root V-groove welds on carbon steel pipe. Provides procedures for making open-root V-groove welds with FCAW equipment on pipe in the 1G-ROTATED, 2G, 6G, and 66 positions.

GTAW – Carbon Steel Pipe (80 Hours)
Trainee $19
Instructor $19
(Module ID 29304-10) Explains how to set up GTAW equipment for open-root V-groove welds, and explains how to prepare for and make open-root V-groove welds on carbon steel pipe. Provides procedures for making open-root V-groove welds with GTAW equipment on pipe in the 2G, 6G, and 66 positions.

GTAW – Low Alloy and Stainless Steel Pipe
(70 Hours)
Trainee $19
Instructor $19
(Module ID 29305-10) Explains how to set up GTAW equipment for open-root V-groove welds on low-alloy and stainless steel pipe, and explains how to prepare for and make open-root V-groove welds on low-alloy and stainless steel pipe. Provides procedures for making open-root V-groove welds with GTAW equipment on low-alloy and stainless steel pipe in the 2G, 6G, and 66 positions.

SMAW: Stainless Steel Groove Welds
(100 Elective Hours)
Trainee $19
Instructor $19
(Module ID 29306-10) Explains stainless steel metallurgy; how to select SMAW electrodes for stainless steel welds; and how to prepare weld coupons; and how to set up SMAW equipment for welding stainless steel. Provides procedures for making open-root V-groove welds with SMAW equipment on stainless steel pipe in the 1G-ROTATED, 2G, 6G, and 66 positions. Includes procedures for making open-root V-groove welds with SMAW equipment on pipe in the 1G-ROTATED, 2G, 6G, and 66 positions.

GMAW – Pipe (60 Hours)
Trainee $19
Instructor $19
(Module ID 29302-10) Explains how to set up GMAW equipment for open-root V-groove welds, and explains how to prepare for and make open-root V-groove welds on carbon steel pipe. Provides procedures for making open-root V-groove welds with GMAW equipment on pipe in the 1G-ROTATED, 2G, 6G, and 66 positions.

FCAW – Pipe (60 Hours)
Trainee $19
Instructor $19
(Module ID 29303-10) Explains how to set up FCAW equipment for open-root V-groove welds, and explains how to prepare for and make open-root V-groove welds on carbon steel pipe. Provides procedures for making open-root V-groove welds with FCAW equipment on pipe in the 1G-ROTATED, 2G, 6G, and 66 positions.

GTAW – Carbon Steel Pipe (80 Hours)
Trainee $19
Instructor $19
(Module ID 29304-10) Explains how to set up GTAW equipment for open-root V-groove welds, and explains how to prepare for and make open-root V-groove welds on carbon steel pipe. Provides procedures for making open-root V-groove welds with GTAW equipment on pipe in the 2G, 6G, and 66 positions.
Alternative Energy


**PAPERBACK**

**Product Supplements**
- PowerPoint® Presentation Slides

**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.

**Introduction to Alternative Energy** (25 Hours)

(Module ID 74101-11) Identifies the need for alternative energy development. Describes the contributions and potential of individual alternative energy sources. Also covers the present U.S. electrical grid and issues affecting specific alternative energy source tie-in and reliability.

**Biomass and Biofuels** (22.5 Hours)

(Module ID 74102-11) Describes potential sources of biomass and biofuels and discusses their advantages and disadvantages for energy production. Discusses the future of biomass as well as biomass energy applications.

**Nuclear Power** (25 Hours)

(Module ID 74103-11) Describes nuclear power and its sources. Discusses the advantages and disadvantages of nuclear power, the future of nuclear energy, and nuclear power generation.

**Solar Power** (25 Hours)

(Module ID 74104-11) Describes solar photovoltaic (PV) power and how it is harnessed. Identifies the advantages and disadvantages of solar energy. Discusses the past, present, and future of solar energy, as well as solar PV applications.

**Wind Power** (22.5 Hours)

(Module ID 74105-11) Describes wind power and how it is harnessed. Identifies the advantages and disadvantages of wind energy. Discusses the past, present, and future of wind energy, as well as wind energy applications.

**Solar Photovoltaics**

- **L1 SOLAR PHOTOVOLTAIC SYSTEMS INSTALLER**

**LEVEL 1**

- 217.5 Hours (Includes 72.5 hours of Core Curriculum which is a prerequisite for Level 1 completion and must be purchased separately. See p. 10 for ordering information.)
- Published: 2011
- Developed using NABCEP’s PV Task Analysis and aligned with NABCEP’s PV Installer Certification.
- Trainee Guide and individual trainee modules are full color.
- Introduction to Solar Photovoltaics (Module ID 57101-10) has been approved for 40 general continuing education hours under GBCI’s Credential Maintenance Program.
- NCCER is a recognized accrediting body for institutions to become providers of the NABCEP Entry Level Exam.
- This craft requires additional instructor qualifications. For more information, contact NCCER Credentialing Services at 1-888-622-3720.

**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.

**Introduction to Solar Photovoltaics** (40 Hours)
- Instructor S22  ISBN 978-0-13-213727-0

(Module ID 57101-10) Covers the basic concepts of PV systems and their components, along with general sizing and electrical/mechanical design requirements. Also provides an overview of performance analysis and troubleshooting. Successful completion of this module will help prepare trainees for the North American Board of Certified Energy Practitioners (NABCEP) PV Entry Level Exam.
Sustainable Construction Supervisor

Product Supplements

PowerPoint® Presentation Slides
ISBN 978-0-13-257315-3 $40

Sustainable Construction Supervisor provides front-line supervisors with sustainable construction management techniques as they relate to targeted construction-phase LEED points for their projects. Topics include project sustainability goals, Green building materials and technologies, Green building methods and processes, and more.

Your Role in the Green Environment

ELECTRONIC Access Code ONLY for Trainee Guide: $27
(must be ordered electronically via OASIS; does not include print book)

Geared to entry-level craft workers, Your Role in the Green Environment provides pertinent information concerning the Green environment, construction practices, and building rating systems. The Instructor’s Guide includes ‘Green’ building laboratory exercises in carpentry, electrical, plumbing, and HVAC. The culminating project is a two-bedroom home, with kitchen, bathroom, laundry room, and open space. Materials lists, construction methods, and a framing plan are included.

Weatherization

As energy efficiency is becoming a priority for homeowners across America, many are turning to the weatherization industry to assist in their efforts. NCCER’s Weatherization program offers training that exceeds the existing standards for weatherization technicians, crew chiefs, and building auditors. This program combines existing NCCER curricula with new building science modules that address the specific needs within this industry. Dual credentials are available within this program. Note: Instructors wishing to teach NCCER’s Weatherization program must meet specific qualifications. For more information, please contact Credentialing services dept at 1-888-622-3720.
Introduction to Weatherization

**L1 WEATHERIZATION TECHNICIAN**

**MODULES**

- **145 Hours** (Includes 90 hours of Fundamentals of Weatherization which is a prerequisite for Level One completion and must be purchased separately.)
- Published: 2010
- Trainee Guide and individual trainee modules are full color.

**Curriculum Notes**

- **145 Hours** (Includes 90 hours of Fundamentals of Weatherization which is a prerequisite for Level One completion and must be purchased separately.)
- Published: 2010
- Trainee Guide and individual trainee modules are full color.

**PAPERBACK ISBN**

- **Trainee Guide:** $67 978-0-13-256957-6
- **Instructor’s Guide:** $67 978-0-13-256984-2

**Product Supplements**

- **PowerPoint® Presentation Slides**

**LEVEL 2 WEATHERIZATION CREW CHIEF**

**MODULES**

- **162.5 Hours**
- Published: 2011
- Trainee Guide and individual trainee modules are full color.

**Curriculum Notes**

- **162.5 Hours**
- Published: 2011
- Trainee Guide and individual trainee modules are full color.

**Product Supplements**

- **PowerPoint® Presentation Slides**

**LEVEL 1 WEATHERIZATION TECHNICIAN**

**MODULES**

- **145 Hours** (Includes 90 hours of Fundamentals of Weatherization which is a prerequisite for Level One completion and must be purchased separately.)
- Published: 2010
- Trainee Guide and individual trainee modules are full color.

**Curriculum Notes**

- **145 Hours** (Includes 90 hours of Fundamentals of Weatherization which is a prerequisite for Level One completion and must be purchased separately.)
- Published: 2010
- Trainee Guide and individual trainee modules are full color.

**PAPERBACK ISBN**

- **Trainee Guide:** $67 978-0-13-256957-6
- **Instructor’s Guide:** $67 978-0-13-256984-2

**Product Supplements**

- **PowerPoint® Presentation Slides**
### Weatherization Level 2 (continued)

#### Introduction to Heating (15 Hours)
(Module ID 03108-07; from HVAC Level One)
- **Trainee $19**
- **Instructor $19**
- **ISBN 978-0-13-266300-7**

#### Chimneys, Vents, and Flues (5 Hours)
(Module ID 03202-07; from HVAC Level Two)
- **Trainee $19**
- **Instructor $19**

#### Air Distribution Systems (10 Hours)
(Module ID 03109-07; from HVAC Level One)
- **Trainee $19**
- **Instructor $19**
- **ISBN 978-0-13-266302-1**

#### Air Quality Equipment (5 Hours)
(Module ID 03204-07; from HVAC Level Two)
- **Trainee $19**
- **ISBN 978-0-13-266314-4**
- **Instructor $19**
- **ISBN 978-0-13-266324-3**

#### Indoor Air Quality (15 Hours)
(Module ID 03403-09; from HVAC Level Four)
- **Trainee $19**
- **Instructor $19**

#### Diagnostics and Management Practices (30 Hours)
- **Trainee $19**
- **Instructor $19**
  (Module ID 59201-10) Explains how to interpret energy audit reports and how to prioritize and schedule air sealing. Describes how to perform the following tests: blower door, pressure pan, burner efficiency, carbon monoxide, draft, and spillage. Also covers lead-safe work practices and how to perform quality inspections on completed work.

#### Product Supplements

<table>
<thead>
<tr>
<th>Item</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PowerPoint® Presentation Slides</strong></td>
<td>978-0-13-257682-6</td>
</tr>
<tr>
<td><strong>PAPERBACK</strong></td>
<td>978-0-13-257675-8</td>
</tr>
<tr>
<td><strong>Instructor's Guide</strong></td>
<td>978-0-13-257683-3</td>
</tr>
</tbody>
</table>

#### L2 BUILDING AUDITOR

**LEVEL 2**

**Curriculum Notes**
- 172.5 Hours
- Published: 2011
- Trainee Guide and individual trainee modules are full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

**PAPERBACK**

<table>
<thead>
<tr>
<th>Trainee Guide</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>$94</td>
<td>978-0-13-257675-8</td>
</tr>
</tbody>
</table>

**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.

### Trade Mathematics

- **10 Hours**
  (Module ID 03102-07; from HVAC Level One)
  - **Trainee $19**
  - **ISBN 978-0-13-266307-6**
  - **Instructor $19**

### Introduction to Cooling (30 Hours)

- **Trainee $19**
- **ISBN 978-0-13-266287-1**
- **Instructor $19**
- **ISBN 978-0-13-266299-4**

### Performing a Building Audit (42.5 hours)

- **Trainee $19**
- **Instructor $19**
- **ISBN 978-0-13-266300-7**

- **Module ID 59202-10** Explains how to interview homeowners and educate them about saving energy in their homes. Explains how to inspect and evaluate the building envelope and HVAC systems. Describes how to perform the following tests: blower door, pressure pan, burner efficiency, carbon monoxide, draft, and spillage. Also covers lead-safe work practices, baseload energy use, and the purpose of the forms and reports a building auditor is responsible for completing.

---

**To Order Call: 1-800-922-0579**

**www.nccer.org/bookstore**
Introduction to Wind Turbine Safety
(Module ID 58102-11) Expands on earlier safety training and provides coverage of safety concerns of working in the interception of wind energy through a rotor, and an introduction to wind turbine safety. (Module ID 58101-11) Introduces the fundamentals of generating electrical power from wind energy. A brief history of wind energy is included as well as wind science, related components. Simple hydraulic system maintenance is also introduced.

Introduction to Electrical Circuits

Electrical Theory

Electrical Test Equipment

Electrical Wiring
(Module ID 26105-11) Discusses the basics of power generation and the generators used in wind turbines. Reviews how power is distributed and controlled during various modes of wind turbine operation. Simple one-line diagrams are also covered.

Fasteners and Torquing

Lubrication

Switching Devices

Wind Turbine Power Distribution Systems

Introduction to Bearings

Electrical Theory
(Module ID 58105-11) Explores basic lubrication theory and related equipment. Includes the different applications and types of lubricants used in the wind turbine environment. Reviews OSHA’s hazard communication program and the EPA’s hazardous waste control program. Includes in-depth coverage of material safety data sheets.

To Order Call: 1-800-922-0579 www.nccer.org/bookstore

Stay Connected: Facebook Twitter

Wind Energy

Climbing Wind Towers

Fasteners and Torquing

Electrical Wiring
(Module ID 26105-11) Provides coverage of switching devices related to the power distribution and control of wind turbines. Mechanical and solid-state relay types are presented, as well as typical wind turbine control wiring diagrams. Explains various time delay schemes and how they can be applied.
While this module has been designed to assist the recently promoted crew leader, it is beneficial for anyone in management. The course covers basic leadership skills and explains different leadership styles, communication, delegating, and problem solving. Job-site safety and the crew leader’s role in safety are discussed, as well as project planning, scheduling, and estimating. Includes performance tasks to assist the learning process.

**Fundamentals of Crew Leadership**

**Product Supplements**

**PowerPoint® Presentation Slides**

ISBN 978-0-13-257329-0  
$40

**Human Relations and Problem Solving**

(20 Hours)

Participant $19  
Instructor $19  

(Module ID MT202-01) 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.

**Safety**

(7.5 Hours)

Participant $19  
ISBN 978-0-13-103668-0  
Instructor $19  

(Module ID MT203-01) Describes 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.

**Quality Control**

(5 Hours)

Participant $19  
Instructor $19  

(Module ID MT204-01) Defines different types of quality control. Explains how to incorporate quality and safety through effective communication, document control, and inspections.

**Contract and Construction Documents**

(5 Hours)

Participant $19  
Instructor $19  

(Module ID MT205-01) Teaches how to understand and interpret construction drawings, technical specifications, and as-built drawings. Includes different types of bidding, contracts, change orders, closeout documents, and more.

**Document Control and Estimating**

(10 Hours)

Participant S19  
ISBN 978-0-13-103671-0  
Instructor S19  

(Module ID MT206-01) Provides an introduction to using and maintaining document control. Defines the elements of material, labor, and equipment estimates and how to develop, organize, and look for errors in an estimate.

**Planning and Scheduling**

(17.5 Hours)

Participant S19  
Instructor S19  

(Module ID MT207-01) Introduces 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.

**Resource Control and Cost Awareness**

(15 Hours)

Participant S19  
Instructor S19  

(Module ID MT208-01) Explains how to measure job-site productivity and how to increase it. Discusses resources, materials, tools, equipment, labor, quality, and cost and resource control. Introduces cost awareness and types of reports.

**Sustainable Construction Supervisor**

Sustainable Construction Supervisor has been developed to instruct construction managers on sustainable construction management, the LEED rating system as it would apply to oversight of their projects and crews, and how to supervise and train their subcontractors and crews so that LEED points aren’t unintentionally sacrificed.

This module is published in full color and is competency-based. An assessment is also available. For more information, see p. 68.
Creating a Zero-Accident Work Environment.

Presents several responsibilities regarding safety. Covers loss prevention and security, and identifies the project manager's duties and responsibilities.

Instructor $19

(MODULE ID 44102-08) 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.

Interpersonal Skills (12.5 Hours)


(Module ID 44103-08) Discusses the values and expectations of the workplace, 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.

Issues and Resolutions (15 Hours)


(Module ID 44104-08) Describes the key elements of successful negotiations and negotiating techniques. Explains 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.

Construction Documents (10 Hours)

Instructor $19  ISBN 978-0-13-603861-0

(Module ID 44105-08) 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.

Construction Planning (10 Hours)


(Module ID 44106-08) 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.

Estimating and Cost Control (15 Hours)

Instructor $19  ISBN 978-0-13-603864-4

(Module ID 44107-08) 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.

Scheduling (15 Hours)


(Module ID 44108-08) Explains 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.

Resource Control (10 Hours)


(Module ID 44109-08) Identifies resources that must be controlled, factors that affect production control, and production control standards. Explains the project manager’s role in the process. Defines production and productivity, and describes how to evaluate and improve production control and productivity.

Quality Control and Assurance (5 Hours)


(Module ID 44110-08) 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.

Continuous Improvement (5 Hours)


(Module ID 44111-08) 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.

Impact, provides example scenarios of issues commonly encountered by construction managers. Participants are prompted to consider how they would apply techniques they’re learning in the classroom to these real-life, on-the-job situations. Instructional materials and recommended solutions are included.

Management DVD

Minor Decisions: Major Impact; How to Deal with Real Issues in Project Management

Published: 2009

DVD: $100
Looking for a way to stimulate class discussions about management topics? NCCER’s DVD, Minor Decisions: Major Impact, provides example scenarios of issues commonly encountered by construction managers. Participants are prompted to consider how they would apply techniques they’re learning in the classroom to these real-life, on-the-job situations. Instructional materials and recommended solutions are included.

For more information or to see a clip of the video, visit www.nccer.org.
250,000. That's not just a number needed to fill the jobs created by workers leaving the building and plant construction industry. It's the number of men and women leaving jobs in shipbuilding, shipyards, ship repair facilities, and offshore rig — the Maritime industry. This industry is facing a skilled workforce crisis due to an aging workforce and dwindling pool of workers from which to draw. In partnership with the NMEC (National Maritime Education Council), NCCER has developed the first ever standardized and nationally recognized Maritime curriculum. This program includes training material in Maritime 'Core' and Pipelfitting, and Structural Fitter, and will soon be followed by assessments to certify journey-level skills.

**Introduction to the Maritime Industry**

**12.5 Hours**

Published: 2013

Module ID 84101-13

**PAPERBACK**

ISBN

Trainee Guide: $22 978-0-13-295443-3


Introduces the facilities, methods, and processes used in the shipbuilding and repair industry. Describes the impact the industry has on the U.S. economy and explores the various craft opportunities available to workers. Provides an overview of the safety practices specific to the industry.

**Maritime Pipefitting**

**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.

**Orientation to the Maritime Pipefitting Trade**

(5 hours)

Trainee $19 978-0-13-340590-3

Instructor $19 978-0-13-340606-1

(Module ID 85101-13) Provides an overview of the maritime pipefitting trade and its career opportunities. Trade safety principles are introduced, as well as the responsibilities and characteristics of a good pipefitter.

**Maritime Pipefitting Trade Math**

(15 hours)

Trainee $19 978-0-13-340591-0

Instructor $19 978-0-13-340607-8

(Module ID 85102-13) Explains how to solve a wide variety of maritime pipefitting math problems, including those related to common geometrical figures. The process of determining lengths in pipe offsets for general and rolling offsets is also presented.

**Pipefitting Power Tools**

(15 hours)

Trainee $19 978-0-13-340593-4

Instructor $19 978-0-13-340609-2

(Module ID 85104-13) Covers power tool safety and procedures for selecting, inspecting, using, and maintaining power tools that are common in the maritime environment. Procedures for threading pipe are provided in a step-by-step format. Guidelines for both electrical and pneumatic tools are provided.

**Oxyfuel Cutting**

(17.5 hours)

Trainee $19 978-0-13-340594-1

Instructor $19 978-0-13-340610-8

(Module ID 85105-13) Describes the procedures and safety requirements related to oxyfuel cutting. Detailed instructions for setting up, lighting, and using oxyfuel cutting torches is provided. Common techniques, such as straight line cutting, beveling, washing, and gouging are reviewed. Oxyfuel gas supply arrangements from both cylinders and manifolds are also presented.

**Ladders and Scaffolds**

(12.5 hours)

Trainee $19 978-0-13-340595-8

Instructor $19 978-0-13-340611-5

(Module ID 85106-13) Explains how to identify various types of ladder and scaffold systems and describes their safe use. The pre-use inspection requirements for both ladders and scaffolds are presented.
Maritime Pipefitting Level 2

L2 MARITIME PIPEFITTING

Pricing information is for ordering individual modules only.

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.

PAPERBACK ISBN

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.

Piping Systems (5 hours)
(Module ID 85201-13) Identifies and explains basic types of piping systems found in the maritime environment and the materials used for various applications. Explains how thermal expansion in piping systems can be accommodated. Coverage of common insulation types and installation practices is also included.

Structural Fitter

L1 STRUCTURAL FITTER

Pricing information is for ordering individual modules only.

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.

Welding Safety (2.5 Hours)
(Module ID 29101-09; from Welding Level One)

Oxyfuel Cutting (17.5 Hours)
(Module ID 29102-09; from Welding Level One)

Base Metal Preparation (12.5 Hours)
(Module ID 29105-09; from Welding Level One)

Weld Quality (10 Hours)
(Module ID 29106-09; from Welding Level One)

Shielded Metal Arc Electrodes (2.5 Hours)
(Module ID 29108-09; from Welding Level One)

Tack Welding (40 Hours)
(Module ID 86101-14) Describes how to set up welding equipment, strike an arc, and make tack welds in order to maintain proper alignment of parts in anticipation of finish welding. Covers the machines, tools, and techniques used to make tack welds in various positions.

Fire Watch (5 Hours)
(Module ID 86102-14) Prepares a worker to perform fire watch duties in support of welding and flame cutting activities. Describes the classes of fires and the methods used to extinguish them, as well as the responsibilities of a person assigned as a fire watch.

Introduction to Structural Fitter Drawings (10 Hours)
(Module ID 86103-14) Covers fundamental skills needed to read fabrication drawings that are commonly used by structural fitters. Focuses on basic drawing elements such as title blocks, revision blocks, and drawing lines and introduces plan, elevation, and detail drawings.

To Order Call: 1-800-922-0579 www.nccer.org/bookstore
Structural Fitter Level 1 (continued)

Fitting One  (40 Hours)
(Module ID 86104-14) Introduces layout tools, fitting tools, and fitting aids used to fit up and align plate joints. Incorporates hands-on tasks through which the beginning fitter will learn how to perform basic layout, alignment, and fit-up tasks.

Cutting and Burning Processes  (40 Hours)
(Module ID 86201-14) Expands on flame cutting methods covered in Level 1, including laying out and cutting bevels, chamfers, and circles. Also covers the methods used to cut or split common structural components such as beams and bars.

Advanced Structural Print Reading  (40 Hours)
(Module ID 86202-14) Covers interpretation of fabrication and installation drawings, sketching of isometric and orthographic drawings, and interpretation of welding symbols.

Fitting Two  (140 Hours)
(Module ID 86203-14) Explains selection and application of gaskets and packings, fit-up tasks, and inspection of finished work. Also covers structural accessories, proper measuring techniques, and creating a materials list.
PTAP
NCCER offers the Pipeliner Training and Assessment Program (PTAP) which consists of the 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 correlate to NCCER’s standardized Pipeline Curriculum and can be used to help determine operator qualifications on selected Covered Tasks as identified by the pipeline industry. For more information on the Pipeline Skills Assessments, contact NCCER Customer Service at 1-888-622-3720.

Pipeline Covered Task Web-Based Training

Developed in Adobe Flash, this web-based training provides instruction to support various pipeline covered tasks. The content is closely tied to the Pipeline learning series and is presented as a slideshow to incorporate both audio and active animation. Full versions of the Pipeline module(s) are included for further study and reference. For more information on this product and a complete list of ISBNs for ordering, visit www.nccerconnect.com. To order, visit the online bookstore at nccer.pearsonconstructionbooks.com and search for “Pipeline.”

<table>
<thead>
<tr>
<th>Covered Task Number</th>
<th>Covered Task Name</th>
<th>Corresponding NCCER Module(s)</th>
<th>ISBN Trainee:</th>
<th>ISBN Instructor:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No CT for this module</td>
<td>Abnormal Operating Conditions</td>
<td></td>
<td>978-0-13-213272-5</td>
<td>978-0-13-213527-6</td>
</tr>
<tr>
<td>64</td>
<td>Operations of a Pipeline System - Gas Pipeline</td>
<td>65105, 65106</td>
<td>978-0-13-213239-8</td>
<td>978-0-13-213531-3</td>
</tr>
<tr>
<td>65</td>
<td>Operations of a Pipeline System - Liquid Pipeline Control Center</td>
<td>67104, 67105</td>
<td>978-0-13-213241-1</td>
<td>978-0-13-213533-3</td>
</tr>
<tr>
<td>32</td>
<td>Monitoring Excavation Activities</td>
<td>62107</td>
<td>978-0-13-257178-4</td>
<td>978-0-13-257180-7</td>
</tr>
<tr>
<td>24</td>
<td>Inspect, Test and Calibrate Pressure Limiting Devices and Relief Valves</td>
<td>63205</td>
<td>978-0-13-257222-1</td>
<td>978-0-13-257223-1</td>
</tr>
<tr>
<td>25</td>
<td>Inspect, Test and Calibrate Pressure Switches and Transmitters</td>
<td>64206</td>
<td>978-0-13-257271-7</td>
<td>978-0-13-257278-7</td>
</tr>
<tr>
<td>20</td>
<td>Inspect Valves</td>
<td>62203</td>
<td>978-0-13-257005-9</td>
<td>978-0-13-257105-6</td>
</tr>
<tr>
<td>14</td>
<td>Place and Maintain Line Markers</td>
<td>62106</td>
<td>978-0-13-257395-1</td>
<td>978-0-13-257398-2</td>
</tr>
<tr>
<td>27</td>
<td>Inspection of Breakout Tanks</td>
<td>62202</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

Field Abnormal Operating Conditions

NEW!
10 Hours
To Be Published: Spring 2014
Module ID 71011-14

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.

Control Center Abnormal Operating Conditions

NEW!
10 Hours
To Be Published: Spring 2014
Module ID 71102-14

Introduces the abnormal operating conditions that can occur on a pipeline or in a pipeline facility. Explains 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 these conditions.
**Gas Pipeline Operations**

**Basic Pipeline Pneumatics and Equipment (10 Hours)**
- Trainee $20
- Instructor $20
- (Module ID 67102-02) 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 included.

**Pipeline Communications (10 Hours)**
- Trainee $20
- Instructor $20
- (Module ID 67103-02) 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.

**Routine Field and Facility Operations (CT 50, 51, 54, 56, 57, 58, and 65) (30 Hours)**
- Trainee $20
- Instructor $20
- (Module ID 67107-02) 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.

**Routine Control Center Operations (CT 50, 51, 54, 56, 57, 58, and 65) (30 Hours)**
- Trainee $20
- Instructor $20
- (Module ID 67105-02) 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).

**Quality Control and Measurement (20 Hours)**
- Trainee $20
- Instructor $20
- (Module ID 67106-02) 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.

**Abnormal Operating Conditions (10 Hours)**
- Trainee $20
- Instructor $20
- (Module ID 67104-02) Provides an overview of 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.

**Liquid Pipeline Field Operations**

**Liquid Pipeline General Abnormal Operating Conditions (5 Hours)**
- Trainee $20
- Instructor $20
- (Module ID 66102-02) 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.

**Routine Field and Facility Operations (CT 63.1, 63.2, and 63.4) (25 Hours)**
- Trainee $20
- Instructor $20
- (Module ID 60104-02) 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.

**Routine Field and Facility Operations (CT 63.3) (15 Hours)**
- Trainee $20
- Instructor $20
- (Module ID 60106-02) 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.
Liquid Pipeline Control Center Operations

**Field Quality Control** (15 Hours)
Trainee $20  
Instructor $20  
(Module ID 60107-02) Introduces field quality control procedures including activation of tank mixing devices, collection of product samples, product testing, pipeline strappings.

**Field Measurement** (20 Hours)
Trainee $20  
Instructor $20  
ISBN 978-0-13-038232-0  
(Module ID 60108-02) Introduces techniques used in field measurement of products in the pipeline, including measurement components, types of meters, measurement of custody transfers and receipts, verification of meter accuracy, flow paths and utilization of tank strappings.

**Instructor Guide(s) listed above. The following ISBN and pricing information is for ordering individual modules only.**

**MODULES**

- **Introduction to the Pipeline Industry (15 Hours)**  
  Trainee $20  
  Instructor $20  
  ISBN 978-0-13-038234-4  
  (Module ID 66101-02) 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.

- **Control Center Abnormal Operating Conditions (5 Hours)**  
  Trainee $20  
  Instructor $20  
  (Module ID 65102-02) Introduces the abnormal operating conditions that can occur on a pipeline or in a pipeline facility. Explains 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 these conditions.

- **Basic Pipeline Hydraulics and Equipment (10 Hours)**  
  Trainee $20  
  Instructor $20  
  (Module ID 65103-02) Explains pipeline hydraulics safety, basic principles of hydraulic systems, hydraulic properties of petroleum products, pipeline design factors, and basic pipeline equipment.

- **Pipeline Communications (7.5 Hours)**  
  Trainee $20  
  Instructor $20  
  ISBN 978-0-13-038261-0  
  (Module ID 65104-02) Introduces 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.

- **Liquid Pipeline Measurement and Quality Control (CT 64.2, and 64.4) (35 Hours)**  
  Trainee $20  
  Instructor $20  
  (Module ID 65105-02) Introduces 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 field station monitoring activities with the SCADA system, and document pipeline activities with the SCADA system.

- **Routine Control Center Operations (CT 64.3) (30 Hours)**  
  Trainee $20  
  Instructor $20  
  (Module ID 65106-02) 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.

- **Monitoring Pipeline Operations – Control Center (CT 64.1) (30 Hours)**  
  Trainee $20  
  Instructor $20  
  (Module ID 65107-02) Explains how to activate and shut down a pipeline system through the control center.

**Pipeline Corrosion Control**

**MODULES**

- **Introduction to the Pipeline Industry (15 Hours)**  
  Trainee $20  
  Instructor $20  
  ISBN 978-0-13-038234-4  
  (Module ID 66101-02) 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.

- **Liquid Pipeline General Abnormal Operating Conditions (5 Hours)**  
  Trainee $20  
  Instructor $20  
  (Module ID 66102-02) 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.
Pipeline Corrosion Control Level 1 (continued)

Locating Pipeline and Cable (CT 14.1 and 17.1) (5 Hours)
Trainee $20
Instructor $20
ISBN 978-0-13-038277-1
ISBN 978-0-13-038287-0
(Module ID 61103-02) 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.

Measure Pit Depth and Wall Thickness (CT 8.1, 8.2, and 8.3) (5 Hours)
Trainee $20
Instructor $20
(Module ID 61104-02) Explains how to use pit gauges to check pit depth, length, and profile. Describes how to take multiple readings for RSTRENGTH data and how to use ultrasonic meters to check pipewall thickness.

Inspect Buried and Submerged Pipe When Exposed (CT 5.1, 5.2, and 5.3) (5 Hours)
Trainee $20
Instructor $20
(Module ID 61105-02) Identifies types of pipe coatings. Describes the different causes of coating damage, and how to inspect pipe for corrosion and mechanical damage.

Apply and Repair External Coatings on Buried and Submerged Pipe (CT 13.1 and 13.2) (10 Hours)
Trainee $20
Instructor $20
(Module ID 61106-02) Describes apply and repair external coatings on buried pipe. Describes the different causes of coating damage, and how to visually inspect pipe for corrosion and mechanical damage. Describes performance of coating application for buried pipe.

Cathodic Protection Measurement (CT 1.3 and 9.1) (15 Hours)
Trainee $20
Instructor $20
(Module ID 61110-02) Identifies close interval survey methods and the procedure for performing an inspection. Describes how to apply and perform close interval survey testing in a CP system, including causes and testing. Describes how to use corrosion monitoring tools and accurately record the measurements obtained.

Internal Corrosion Control (CT 10.1, 10.2, and 11) (7.5 Hours)
Trainee $20
Instructor $20
(Module ID 61111-02) Explains how corrosion monitoring probes operate and the data that is collected. Describes how to use corrosion measurement tools and accurately record the measurements obtained.

Test Station Repair (CT 2.1, 2.2, 2.3, and 2.4) (5 Hours)
Trainee $20
Instructor $20
(Module ID 61109-02) Discusses 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.

Maintain and Repair Rectifiers (CT 4) (15 Hours)
Trainee $20
Instructor $20
(Module ID 61202-02) 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.

Mitigate Interference (CT 1.3 and 9.1) (15 Hours)
Trainee $20
Instructor $20
(Module ID 61203-02) Identifies the sources of interference current in a CP system, including causes and testing. Describes mitigation and reduction techniques for a CP system, including bonding, coating, galvanic anodes, and electrical shields.

Test and Repair Shorted Casings (CT 9.5) (15 Hours)
Trainee $20
Instructor $20
(Module ID 61204-02) Describes testing casings. Explains causes of shorted casings, how to recognize them, and tests for shorted casing conditions. Covers the repair of shorted casings, including replacing components.

Conduct Close Interval Survey (CT 1.2 and 1.4) (15 Hours)
Trainee $20
Instructor $20
(Module ID 61205-02) Identifies 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 a survey.

Perform Coating Inspection (CT 7.7) (15 Hours)
Trainee $20
Instructor $20
(Module ID 61206-02) Describes required pre-inspection activities, including surface preparation, degree of cleanliness, profile, and coating mixing, thickness, adhesion, and curing. Describes the use of pinhole testing and causes of coating failures, including application problems, specifications, and diagnosis.

Perform High-Pressure Blasting/Surface Preparation (CT 7.4 and 13.3) (15 Hours)
Trainee $20
Instructor $20
(Module ID 61207-02) Describes basic abrasive blast system equipment and describes the characteristics of blast cleaning media. Describes preparation standards, including surface preparation, and testing. Also covers chemical strippers.

Apply Coatings Using Spray Applications (CT 7.6 and 13.5) (15 Hours)
Trainee $20
Instructor $20
ISBN 978-0-13-038254-0
(Module ID 61208-02) Describes types of paint and coating materials, including pigments, resins, solvents, and additives, including film-forming and generic coatings and powder coatings. Covers surface preparation, application, and testing. Describes air, electrostatic, and thermal spray systems.
TOOLs OF THE TRADE (15 HOURS)
Trainee $20
Instructor $20
(Module ID 64105-02) Identifies hand tools used in the pipeline & E&I trade. Also explains trade-specific power tools, test equipment, and communication equipment.

PIPELINE OPERATIONS (40 HOURS)
Trainee $20
Instructor $20
(Module ID 64106-02) Describes pipeline system hydraulics and ASME ratings and standards. Discusses station control systems and recognizing and responding to AOCs. Also covers pigging operations and proving process meters.

PIPELINE E&I DRAWINGS (30 HOURS)
Trainee $20
Instructor $20
(Module ID 64107-02) Identifies 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.

UNDERSTANDING THE NATIONAL ELECTRICAL CODE® (7.5 HOURS)
Trainee $20
Instructor $20
(Module ID 64108-02) Provides a map for using the NEC®. Introduces the layout and the types of information found within the code book. Presents an easy-to-follow procedure for finding information in the NEC®.

FASTENERS AND ANCHORS (7.5 HOURS)
Trainee $20
Instructor $20
(Module ID 64109-02) Introduces hardware and systems used to mount and support boxes, receptacles, and other electrical components. Covers types of anchors and supports, their applications, and their safe installation.

L2 PIPELINE ELECTRICAL & INSTRUMENTATION

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.

Introduction to the Pipeline Industry (15 Hours)
Trainee $20
Instructor $20
(Module ID 66101-02) 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.

Liquid Pipeline General Abnormal Operating Conditions (5 Hours)
Trainee $20
Instructor $20
(Module ID 66102-02) 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.

Pipeline E&I Safety (15 Hours)
Trainee $20
Instructor $20
(Module ID 66102-02) Describes the types and uses of personal protective equipment and covers hazard communications. Covers lockout/tagout and MSDS requirements; safety rules, regulations, and tools; and worksite hazards.

Trade Math (40 Hours)
Trainee $20
Instructor $20
(Module ID 64103-02) Presents instrumentation formulas and equations. Explains how to calculate load and ampacity, and perform pipeline-specific E&I calculations. Also provides a description of conductors.

Electrical Theory (40 Hours)
Trainee $20
Instructor $20
(Module ID 64104-02) Introduces the electrical concepts used in Ohm’s law as applied to DC series circuits. Discusses atomic theory, electromotive force, resistance, and electric power equations. Also introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchhoff’s voltage and current laws, and circuit analysis.

Electrical Installations in Classified Areas (40 Hours)
Trainee $20
Instructor $20
(Module ID 64201-02) 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.

Use of Meters and Test Equipment (15 Hours)
Trainee $20
Instructor $20
(Module ID 64202-02) Explains general, personal, and test equipment for E&I safety. Covers 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.

Grounding (30 Hours)
Trainee $20
Instructor $20
(Module ID 64203-02) 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 of 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.

Process Control Theory (40 Hours)
Trainee $20
Instructor $20
(Module ID 64204-02) Explains process characteristics and control systems. Describes control loop components and control loops and modes. Discusses types of control applications, including temperature, pressure, flow, and level control.

Supervisory Control Systems (15 Hours)
Trainee $20
Instructor $20
(Module ID 64205-02) 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.

Switches and Transmitters (CT 25, 30, 31) (15 Hours)
Trainee $20
Instructor $20
(Module ID 64206-02) 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 DTT coverage and regulations.

Controllers (CT 26) (15 Hours)
Trainee $20
Instructor $20
(Module ID 64207-02) 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.
Pipeline Electrical & Instrumentation Level 2 (continued)

Valve Actuators (CT 19.5) (15 Hours)
(Module ID 64208-02) 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.

Product Measurement (CT 44.1, 44.2) (40 Hours)
(Module ID 64209-02) Explains custody transfer and how to test, repair, install, and maintain custody transfer equipment and devices. Covers testing, repairing, installing, and maintaining proper equipment, process measurement equipment, and flow measurement equipment.

Analytical Equipment (CT 55) (40 Hours)
Trainee $20  ISBN 978-0-13-038403-4
(Module ID 64210-02) Identifies 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.

L3 PIPELINE ELECTRICAL & INSTRUMENTATION

Curriculum Notes
- 185 Hours
- Published: 2002
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccer.org.

PAPERBACK  ISBN
Trainee Guide: $100  978-0-13-101082-6
Instructor’s Guide: $100  978-0-13-101083-3

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.

Transformers (25 Hours)
(Module ID 64301-02) Describes power systems and explains transformer construction, taps, installation requirements, and connections. Describes power distribution, instruments, control, and isolation transformer types. Also covers transformer maintenance and testing.

Switchgear and MCCs (25 Hours)
Instructor $20  ISBN 978-0-13-103149-4
(Module ID 64302-02) 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.

Low-Voltage and Standby Power (25 Hours)
Instructor $20  ISBN 978-0-13-103150-0
(Module ID 64303-02) Explains pipeline standby generators, batteries, chargers, inverters, converters, and rotary and static UPSs. Also addresses the maintenance and testing of each.

Power Quality (25 Hours)
Instructor $20  ISBN 978-0-13-103152-4
(Module ID 64304-02) Explains power quality and types of defects, power systems, protection, and conditioning equipment. Discusses types of electrical noise and related problems, and possible solutions. Describes static electricity and its effect, system verification testing, and equipment maintenance.

Prime Movers (32.5 Hours)
(Module ID 64305-02) 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.

Facility Auxiliary Systems (22.5 Hours)
(Module ID 64306-02) Includes information on pipeline facility buildings and related systems, including fire, security, vapor recovery, injection, water treatment, cathodic protection, and blending systems.

SCADA (30 Hours)
(Module ID 64307-02) Explains pipeline operations systems, including control, communications, SCADA, and PLCs. Explains redundant systems and control system troubleshooting.

Tools of the Trade (7.5 Hours)
Instructor $20  ISBN 978-0-13-378784-0
(Module ID 61204-13) Describes the identification of and response to the release of product or crude.

Field Abnormal Operating Conditions (10 Hours)
Instructor $20  ISBN 978-0-13-378784-0
(Module ID 71101-14) 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.

Release Identification and Response (5 Hours)
Instructor $20  ISBN 978-0-13-378745-0
(Module ID 62103-13) Describes the identification of and response to the release of product or crude.

Introduction to Pipeline Documents (5 Hours)
Instructor $20  ISBN 978-0-13-378748-1
(Module ID 62105-03) Describes the different types of documents required in the pipeline industry.

Pipeline Maintenance

L1 PIPELINE MAINTENANCE

Curriculum Notes
- 67.5 Hours
- Revised: 2013, Second Edition
- Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.

PAPERBACK  ISBN
Instructor’s Res. Access Card: $100  978-0-13-378297-4

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.

Introduction to the Pipeline Industry (10 Hours)
(Module ID 66101-13) Describes the identification of and response to the release of product or crude.

Field Abnormal Operating Conditions (10 Hours)
Instructor $20  ISBN 978-0-13-359280-1
(Module ID 61203-13) Describes the identification of and response to the release of product or crude.

Low-Voltage and Standby Power (25 Hours)
(Module ID 64303-02) Explains pipeline standby generators, batteries, chargers, inverters, converters, and rotary and static UPSs. Also addresses the maintenance and testing of each.

Power Quality (25 Hours)
(Module ID 64304-02) Explains power quality and types of defects, power systems, protection, and conditioning equipment. Discusses types of electrical noise and related problems, and possible solutions. Describes static electricity and its effect, system verification testing, and equipment maintenance.

Tools of the Trade (7.5 Hours)
Instructor $20  ISBN 978-0-13-378747-4
(Module ID 61204-13) Describes the identification of and response to the release of product or crude.

Field Abnormal Operating Conditions (10 Hours)
(Module ID 71101-14) 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.
Pipeline Maintenance Level 1 (continued)

Line Location and Marking (CTs 14 and 17) (15 Hours)
Instructor S20 ISBN 978-0-13-378749-8
(Module ID 62106-13) Describes the notification process used to prevent pipeline damage, the methods for locating pipelines, and the process for marking pipelines.

Inspect Navigable Water Crossings (CT16) (7.5 Hours)
Instructor S20 ISBN 978-0-13-378763-4
(Module ID 62108-13) Describes the process for inspecting navigable waterway crossings, and reviews reportable observations and reporting procedures for these inspections.

Surface Right-of-Way Inspection (CT 15) (7.5 Hours)
Instructor S20 ISBN 978-0-13-378750-4
(Module ID 62109-13) Describes the process of inspecting right-of-ways by aerial, vehicle, and foot patrols, what constitutes a reportable observation, and proper reporting procedures.

L2 PIPELINE MAINTENANCE

Curriculum Notes (REVISED!)
• 75 Hours
• To Be Revised: Fall 2014, Second Edition
• Instructor’s Resource Access Card includes access code to download detailed lesson plans, module exams, PowerPoint® slides, performance profile sheets and TestGen software.

PAPERBACK ISBN
Trainee Guide: $100
Instructor’s Guide: $100
978-0-13-383046-0
978-0-13-383051-4

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.

Inspect Mainline Valves (CT 20) (7.5 Hours)
Trainee S20 ISBN 978-0-13-384193-0
(Module ID 62203-14) Discusses procedures for inspecting mainline valves and performing basic preventative maintenance.

Tubing (7.5 Hours)
Instructor S20 ISBN 978-0-13-378762-7
(Module ID 62208-14) Introduces types of tubing, tools, and work practices used in pipeline applications. Covers proper storage and handling, cutting, bending, and installation of tubing.

Security and Facility Inspections (2.5 Hours)
Trainee S20 ISBN 978-0-13-384195-4
(Module ID 62209-14) Covers inspection of pipeline facilities, including security systems and other building systems.

Breakout Tank Inspection (CT 271) (7.5 Hours)
Trainee S20 ISBN 978-0-13-384196-1
Instructor S20 ISBN 978-0-13-378769-6
(62202-14) Covers inspections of tanks and tank farms.

Ordering information for Pipeline Maintenance, First Edition:

PAPERBACK ISBN
Trainee Guide: $100
Instructor’s Guide: $100
978-0-13-046678-5
978-0-13-046679-2

L3 PIPELINE MAINTENANCE

Curriculum Notes (LEVEL 3)
• 202.5 Hours
• Published: 2002
• Revision underway. Due in stock 2015.
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccer.com.

PAPERBACK ISBN
Trainee Guide: $100
Instructor’s Guide: $100
978-0-13-101077-2
978-0-13-101078-9

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.

General Maintenance and Winterizing Pipeline Equipment (7.5 Hours)
Instructor S20 ISBN 978-0-13-103161-6
(Module ID 62301-02) Explains preventive and predictive maintenance and general maintenance on rotating machinery. Discusses gas compressors and maintaining pumps and prime movers.

Leak Survey Techniques (CT 18 and S2) (12.5 Hours)
(Module ID 62206-14) Covers techniques for performing leak surveys on liquid and gas pipelines. Includes basic pipeline maintenance issues such as underground structures on the pipeline, maintaining the pipeline route, excavating utilities and pipeline components safely and properly, applying coating, tightening flanges, and running maintenance pigs.

Threaded Pipe (15 Hours)
(Module ID 62210-14) 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.

Mudplugging (5 Hours)
(Module ID 62211-14) Covers how mud plugs are used to isolate vapors on 6” and larger pipe diameters. Includes techniques for mixing and installing mud plugs.

Excavating and Backfilling (CT 32 and 39) (17.5 Hours)
Instructor S20 ISBN 978-0-13-387772-6
(Module ID 62212-14) Identifies the permits required and the procedures for exposing pipe and performing damage inspection. Discusses reporting defects, water inspections, and backfilling.

Hot Tapping and Stoppling® - 2.5” and Larger (CT 40.6, 40.8, 40.9, and 40.91) (15 Hours)
(Module ID 62306-02) Discusses hot tapping procedures, including safety issues, selection of equipment, and preparation for tapping. Covers installing tapping machines, and stoppling procedures.

Tank Repair (40 Hours)
(Module ID 62307-02) Explains complete tank repair, including flange tightening, nondestructive testing, electrically insulated fittings and flanges, welding, bottom repair, bottom replacement, moving, arc 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.

Maintenance Welding on Pipelines (CT 42) (25 Hours)
Trainee S20 ISBN 978-0-13-103163-0
Instructor S20 ISBN 978-0-13-103174-6
(Module ID 62308-02) Covers 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.
Performing Pipeline Disconnection Procedures
(CT 36) (20 Hours)
(Module ID 62309-02) Identifies safety requirements and hazards to safely perform disconnection procedures and maintains disconnected pipelines.

Vault Maintenance and Confined Space Entry
(CT 59) (15 Hours)
Trainee S20  ISBN 978-0-13-103165-4
Instructor S20  ISBN 978-0-13-103176-0
(Module ID 62310-02) Identifies safety requirements and hazards of confined space entry. Discusses vault inspections.

Radiographic Testing of Pipeline Welds
(CT 38.4) 25 Hours
Published: 2003
Module ID 62401-03
Provides specific training for certified SNT-TC-1A Level II radiographic technicians who perform radiographic testing of pipeline welds. Recognition of specific discontinuities using copies of radiographic images is featured.

Liquid Pipeline General Abnormal Operating Conditions
(5 Hours)
Instructor S20  ISBN 978-0-13-038325-1
(Module ID 66101-02) 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.

Pipeline Mechanic Hand and Power Tools
(10 Hours)
(Module ID 63103-02) Introduces hand and power tools used to maintain and install pipeline equipment. Discusses tool safety and procedures for selecting, inspecting, using, and maintaining the tools.

Piping and Mechanical Blueprint Reading
(15 Hours)
Instructor S20  ISBN 978-0-13-038334-0
(Module ID 63104-02) Explains how to read P&IDs, piping isometric drawings, detail sheets, and machine drawings. Describes common components and symbols used in various drawings.

Tubing, Threaded Pipe, and Hoses
(30 Hours)
(Module ID 63105-02) Introduces a variety of tubing, tubing materials, tools, and work practices used in the pipeline industry. Identifies the materials used in threaded piping systems. Describes the types and uses of screwed fittings.

Fasteners
(10 Hours)
(Module ID 63106-02) Covers installation procedures for threaded, nonthreaded, and insulation fasteners used in the pipeline industry.

Identify Types of Valve Actuators/Operators
(15 Hours)
(Module ID 63108-02) Identifies types of manual, electric, hydraulic, and pneumatic valve actuators used in the pipeline industry. Covers storage and handling, installation, and preventive maintenance procedures for these actuators.

Identify, Install, and Maintain Valves
(CT 19.1 through 19.4) (15 Hours)
(Module ID 63107-02) Identifies the valves used in the pipeline industry and covers storage and handling, installation, and preventive maintenance procedures for these valves.

Pipeline Mechanical Hand and Power Tools
(10 Hours)
(Module ID 63103-02) Identifies safety requirements and hazards to safely perform disconnection procedures and maintains disconnected pipelines.

Piping and Mechanical Blueprint Reading
(15 Hours)
Instructor S20  ISBN 978-0-13-038334-0
(Module ID 63104-02) Explains how to read P&IDs, piping isometric drawings, detail sheets, and machine drawings. Describes common components and symbols used in various drawings.

Tubing, Threaded Pipe, and Hoses
(30 Hours)
(Module ID 63105-02) Introduces a variety of tubing, tubing materials, tools, and work practices used in the pipeline industry. Identifies the materials used in threaded piping systems. Describes the types and uses of screwed fittings.

Fasteners
(10 Hours)
(Module ID 63106-02) Covers installation procedures for threaded, nonthreaded, and insulation fasteners used in the pipeline industry.

Identify Types of Valve Actuators/Operators
(15 Hours)
(Module ID 63108-02) Identifies types of manual, electric, hydraulic, and pneumatic valve actuators used in the pipeline industry. Covers storage and handling, installation, and preventive maintenance procedures for these actuators.

Installing Seals and Gaskets
(10 Hours)
(Module ID 63109-02) 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.

To Order Call: 1-800-922-0579  Stay Connected:   www.nccer.org/bookstore
Introduction to Hydraulic Systems (10 Hours)
Trainee $20  Instructor $20
(Module ID 63202-02) Discusses 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.

Specialty and Precision Tools (15 Hours)
Trainee $20  Instructor $20
(Module ID 63203-02) Introduces specialty tools and precision measuring tools and explains how to select, inspect, use, and care for these tools.

Inspect and Repair Valves (CT 20, 21.2, and 21.3) (20 Hours)
Trainee $20  Instructor $20
(Module ID 63204-02) Describes different valve inspection requirements. Covers 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.

Maintain and Repair Pressure Limiting Devices and Relief Valves (CT 22, 23.1, 23.2, and 24) (20 Hours)
Trainee $20  Instructor $20
(Module ID 63205-02) 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.

Introduction to Metering Devices and Provers (10 Hours)
Trainee $20  Instructor $20
ISBN 978-0-13-038357-0
(Module ID 63206-02) Identifies and explains the use of pipeline meters including positive displacement, turbine, ultrasonic, mass-flow, vortex, and orifice. Identifies and explains the use of provers including tank provers, traditional ultrasonic, mass-flow, vortex, and orifice. Identifies and explains how to inspect and replace drivers, replace bearings and seals, and perform preventive maintenance.

Install Mechanical Seals (20 Hours)
Trainee $20  Instructor $20
(Module ID 63210-02) Explains the function and advantages of mechanical seals. Identifies parts and types of mechanical seals. Includes procedures for removing, inspecting, and installing mechanical seals.

Maintain and Repair Drivers (15 Hours)
Trainee $20  Instructor $20
ISBN 978-0-13-038375-4
(Module ID 63211-02) 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 preventive maintenance.

L3 PIPELINE MECHANICAL

Curriculum Notes
• 160 Hours
• Published: 2002
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerinc.com.

PAPERBACK

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.

Installing Rotating Equipment (25 Hours)
Trainee $20  Instructor $20
ISBN 978-0-13-103178-4
(Module ID 63301-02) Identifies 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.

Unit Alignment (40 Hours)
Trainee $20  Instructor $20
(Module ID 63302-02) Describes 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.

Vibration Analysis (5 Hours)
Trainee $20  Instructor $20
(Module ID 63303-02) Covers 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.

Maintain, Troubleshoot, and Repair Pumps (10 Hours)
Trainee $20  Instructor $20
(Module ID 63304-02) Identifies preventive maintenance requirements, inspection requirements, and troubleshooting techniques for pumps used in the pipeline industry. Gives 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 is completed.

Maintain, Troubleshoot, and Repair Pneumatic Valve Actuators/Operators and Systems (CT 19.6 and 21.1) (15 Hours)
Trainee $20  Instructor $20
(Module ID 63306-02) Presents 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.

Maintain, Troubleshoot, and Repair Hydraulic Valve Actuators/Operators and Systems (CT 19.7 and 21.4) (15 Hours)
Trainee $20  Instructor $20
(Module ID 63307-02) Presents 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.

Maintain, Troubleshoot, and Repair Electric Valve Actuators/Operators and Systems (CT 19.5 and 21.5) (15 Hours)
Trainee $20  Instructor $20
(Module ID 63308-02) Presents 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.

To Order Call: 1-800-922-0579  Stay Connected:  www.nccer.org/bookstore
Introduction to the Power Industry

This module sets the stage for trainees entering the electrical energy production and distribution field. It describes the many ways in which electricity can be produced, from burning fossil fuels such as coal and natural gas, to harnessing nuclear energy, and using renewable energy sources such as wind, geothermal, and solar energy.

Power Generation Maintenance Electrician

**MODULES**

**Tools of the Trade** (5 Hours)
- (Module ID 40102-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**Fasteners and Anchors** (5 Hours)
- (Module ID 40103-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**Oxyfuel Cutting** (17.5 Hours)
- (Module ID 40104-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**Gaskets and Packing** (10 Hours)
- (Module ID 40105-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**Craft-Related Mathematics** (15 Hours)
- (Module ID 40106-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**Construction Drawings** (12.5 Hours)
- (Module ID 40107-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**Pumps and Drivers** (5 Hours)
- (Module ID 40108-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**Valves** (5 Hours)
- (Module ID 40109-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**Introduction to Test Instruments** (7.5 Hours)
- (Module ID 40110-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**Material Handling and Hand Rigging** (15 Hours)
- (Module ID 40111-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**Mobile and Support Equipment** (10 Hours)
- (Module ID 40112-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19

**SMAW Equipment and Setup** (5 Hours)
- (Module ID 40113-07; from Industrial Maintenance E&I Technician Level One)
- Trainee $19
- Instructor $19
Conductors and Cables (10 Hours)
(Module ID 40212-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

Conductor Terminations and Splices (10 Hours)
(Module ID 40213-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

Motor Controls (15 Hours)
(Module ID 40304-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Hydraulic Controls (15 Hours)
(Module ID 40311-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Pneumatic Controls (15 Hours)
(Module ID 40312-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19
ISBN 978-0-13-604739-1

Programmable Logic Controllers (17.5 Hours)
(Module ID 40409-09; from Industrial Maintenance E&I Technician Level Four)
Trainee $19
Instructor $19
ISBN 978-0-13-60441-4

Cable Tray (7.5 Hours)
(Module ID 26207-08; from Electrical Level Two)
Trainee $19
Instructor $19

Grounding and Bonding (15 Hours)
(Module ID 26209-08; from Electrical Level Two)
Trainee $19
Instructor $19

Hand Bending (10 Hours)
(Module ID 40208-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19
ISBN 978-0-13-604723-0

Machine Bending of Conduit (15 Hours)
(Module ID 40310-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Electric Lighting (15 Hours)
(Module ID 26203-08; from Electrical Level Two)
Trainee $19
Instructor $19

Practical Applications of Lighting (12.5 Hours)
(Module ID 26303-08; from Electrical Level Three)
Trainee $19
Instructor $19

Hazardous Locations (10 Hours)
(Module ID 40301-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Circuit Breakers and Fuses (12.5 Hours)
(Module ID 26210-08; from Electrical Level Two)
Trainee $19
Instructor $19

Transformer Applications (7.5 Hours)
(Module ID 40306-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Distribution Equipment (17.5 Hours)
(Module ID 40305-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19
ISBN 978-0-13-604749-0

Power Plant Electrical Systems (12.5 Hours)
Trainee $18
Instructor $18
ISBN 978-0-13-272106-0

E&I Test Equipment (10 Hours)
(Module ID 40205-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

E&I Drawings (10 Hours)
(Module ID 40303-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Conductor Installations (10 Hours)
(Module ID 26206-08; from Electrical Level Two)
Trainee $19
Instructor $19

Level 3

Curriculum Notes
• 22.5 Hours
• Published: 2010
• Please note that these modules are drawn as is from various other craft areas. To order modules individually, refer to the specific craft page for ISBNs.
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerinc.com.

PAPERBACK
ISBN
Instructor’s Guide: $94 978-0-13-215426-0

Product Supplements
PowerPoint® Presentation Slides
Power Generation Maintenance Electrician Level 3 (continued)

Motors: Theory and Application (20 Hours)
(Module ID 26202-08; from Electrical Level Two)
Trainee $19
Instructor $19

Motor-Operated Valves (15 Hours)
(Module ID 40313-09; from Industrial Maintenance E&I
Technician Level Three)
Trainee $19
Instructor $19

Control Systems and Fundamental Concepts
(12.5 Hours)
(Module ID 26211-08; from Electrical Level Two)
Trainee $19
Instructor $19

Temporary Grounding (15 Hours)
(Module ID 40308-09; from Industrial Maintenance E&I
Technician Level Three)
Trainee $19
ISBN 978-0-13-604738-4
Instructor $19

Product Supplements

PowerPoint® Presentation Slides
$40

MODELS

Load Calculations — Branch and Feeder Circuits
(17.5 Hours)
(Module ID 26301-08; from Electrical Level Three)
Trainee $19
Instructor $19

Motor Calculations (12.5 Hours)
(Module ID 26309-08; from Electrical Level Three)
Trainee $19
Instructor $19

Overcurrent Protection (25 Hours)
(Module ID 26305-08; from Electrical Level Three)
Trainee $19
ISBN 978-0-13-609294-0
Instructor $19

Advanced Controls (20 Hours)
(Module ID 26407-08; from Electrical Level Four)
Trainee $19
Instructor $19

Motor Operation and Maintenance (10 Hours)
(Module ID 26410-08; from Electrical Level Four)
Trainee $19
Instructor $19

Generator Maintenance (20 Hours)
(Module ID 50401-10) Covers the operating characteristics and
major components of AC and DC generators. Topics include
generator connection methods; voltage regulators; auxiliary
systems; and maintenance procedures.
Trainee $19
Instructor $19
ISBN 978-0-13-266213-0

Switchgear and Breaker Maintenance (25 Hours)
(Module ID 50402-11) Reviews the safety practices associated
with power station electrical work. Explains how medium-
voltage and low-voltage sources are developed and used in the
power station, and how the power station system functions
in a blackout or shutdown situation. Also describes the circuit
breakers, switchgear, and motor control centers used in power
stations, and provides instructions for maintenance of these
devices.
Trainee $19
Instructor $19

Preventive and Predictive Maintenance
(10 Hours)
(Module ID 32401-09; from Industrial Maintenance Mechanic
Level Four)
Trainee $19
Instructor $19

Medium Voltage Terminations/Splices
(10 Hours)
(Module ID 26411-08; from Electrical Level Four)
Trainee $19
Instructor $19

Fire Alarm Systems (15 Hours)
(Module ID 26405-08; from Electrical Level Four)
Trainee $19
Instructor $19

Heat Tracing and Freeze Protection (10 Hours)
(Module ID 26409-08; from Electrical Level Four)
Trainee $19
Instructor $19

Standby and Emergency Systems (12.5 Hours)
(Module ID 40401-09; from Industrial Maintenance E&I
Technician Level Four)
Trainee $19
Instructor $19

PAPERBACK
ISBN
Trainee Guide: $94
978-0-13-215428-4
Instructor’s Guide: $94
978-0-13-215429-1

Curriculum Notes

• 225 Hours (Includes 100 hours of Power Industry
Fundamentals which is a prerequisite for Level 1 completion
and must be purchased separately. See p. 86 for more
information.)

Stay Connected:

Power Generation I&C Maintenance Technician

• Published: 2010
• Includes full color insert
• Please note that these modules are drawn as is from various
other craft areas. To order modules individually, refer to the
specific craft page for ISBNs.
• Instructor’s Guide includes access code to download TestGen
software, module exams, and performance profile sheets

Product Supplements

PowerPoint® Presentation Slides
$40

Tools of the Trade (5 Hours)
(Module ID 40102-07; from Industrial Maintenance E&I
Technician Level One)
Trainee $19
Instructor $19

To Order Call: 1-800-922-0579
Stay Connected: www.nccer.org/bookstore
Power Generation I&C Maintenance Technician Level 1 (continued)

Fasteners and Anchors (5 Hours)
(Module ID 40103-07; from Industrial Maintenance E&I Technician Level One)
Trainee $19
Instructor $19

Oxyfuel Cutting (17.5 Hours)
(Module ID 40104-07; from Industrial Maintenance E&I Technician Level One)
Trainee $19
Instructor $19

Gaskets and Packing (10 Hours)
(Module ID 40105-07; from Industrial Maintenance E&I Technician Level One)
Trainee $19
Instructor $19

Construction Drawings (12.5 Hours)
(Module ID 40107-07; from Industrial Maintenance E&I Technician Level One)
Trainee $19
Instructor $19
ISBN 978-0-13-614597-4

Pumps and Drivers (5 Hours)
(Module ID 40108-07; from Industrial Maintenance E&I Technician Level One)
Trainee $19
Instructor $19
ISBN 978-0-13-614598-1

Valves (5 Hours)
(Module ID 40109-07; from Industrial Maintenance E&I Technician Level One)
Trainee $19
Instructor $19

Material Handling and Hand Rigging (15 Hours)
(Module ID 40111-07; from Industrial Maintenance E&I Technician Level One)
Trainee $19
Instructor $19
ISBN 978-0-13-614601-0

Mobile and Support Equipment (10 Hours)
(Module ID 40112-07; from Industrial Maintenance E&I Technician Level One)
Trainee $19
Instructor $19
ISBN 978-0-13-614623-0

Lubrication (12.5 Hours)
(Module ID 40113-07; from Industrial Maintenance E&I Technician Level One)
Trainee $19
Instructor $19

SWMAW Equipment and Setup (5 Hours)
(Module ID 29107-09; from Welding Level One)
Trainee $19
Instructor $19

L2 POWER GENERATION I&C MAINTENANCE TECHNICIAN

Curriculum Notes
• 167.5 Hours
• Published: 2010
• Please note that these modules are drawn as is from various other craft areas. To order modules individually, refer to the specific craft page for ISBNs.
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

Instructor’s Guide: $94
Trainee Guide: $94

Product Supplements
PowerPoint® Presentation Slides
$40

MODELS

Industrial Safety for E&I Technicians (12.5 Hours)
(Module ID 40201-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

Managing Electrical Hazards (12.5 Hours)
(Module ID 26501-09; from Electrical)
Trainee $22
Instructor $22

Introduction to the National Electrical Code® (5 Hours)
(Module ID 40202-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

Electrical Theory (15 Hours)
(Module ID 40203-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19
ISBN 978-0-13-604718-6

Alternating Current (20 Hours)
(Module ID 40204-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

E&I Drawings (10 Hours)
(Module ID 40303-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

E&I Test Equipment (10 Hours)
(Module ID 40205-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

Conductors and Cables (10 Hours)
(Module ID 40212-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

Conductor Terminations and Splices (10 Hours)
(Module ID 40213-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

Motor Controls (15 Hours)
(Module ID 40304-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Hydraulic Controls (15 Hours)
(Module ID 40311-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Pneumatic Controls (15 Hours)
(Module ID 40312-09; from Industrial Maintenance E&I Technician Level Four)
Trainee $19
Instructor $19

L3 POWER GENERATION I&C MAINTENANCE TECHNICIAN

Curriculum Notes
• 225.5 Hours
• Published: 2010
• Please note that these modules are drawn as is from various other craft areas. To order modules individually, refer to the specific craft page for ISBNs.
• Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

Trainee Guide: $94
Instructor’s Guide: $94

Product Supplements
PowerPoint® Presentation Slides
$40

MODELS

Instrumentation Electrical Circuity (25 Hours)
(Module ID 42205-03; from Instrumentation Level Three)
Trainee $19
Instructor $19

Process Mathematics (15 Hours)
(Module ID 40207-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19
Power Generation I&C Maintenance Technician Level 3 (continued)

Flow, Pressure, Level and Temperature
(15 Hours)
(Module ID 40206-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

Instrument Drawings and Documents, Part One
(15 Hours)
(Module ID 40211-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

Electrical Systems for Instrumentation
(22.5 Hours)
(Module ID 12104-01; from Instrumentation Level One)
Trainee $19
Instructor $19

Relays and Timers
(7.5 Hours)
(Module ID 12208-03; from Instrumentation Level Two)
Trainee $19
Instructor $19
ISBN 978-0-13-103288-0

Switches and Photoelectric Devices
(5 Hours)
(Module ID 12209-03; from Instrumentation Level Two)
Trainee $19
Instructor $19

Tubing
(15 Hours)
(Module ID 40209-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19
ISBN 978-0-13-604710-0

Clean, Purge, and Test Tubing and Piping Systems
(7.5 Hours)
(Module ID 40210-08; from Industrial Maintenance E&I Technician Level Two)
Trainee $19
Instructor $19

Layout and Installation of Tubing and Piping Systems
(22.5 Hours)
(Module ID 40309-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Electronic Components
(10 Hours)
(Module ID 40302-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Panel-Mounted Instruments
(7.5 Hours)
(Module ID 12212-03; from Instrumentation Level Two)
Trainee $19
Instructor $19

Installing Field-Mounted Instruments
(25 Hours)
(Module ID 12213-03; from Instrumentation Level Two)
Trainee $19
Instructor $19

Grounding and Shielding of Instrumentation Wiring
(10 Hours)
(Module ID 12306-03; from Instrumentation Level Three)
Trainee $19
Instructor $19

Process Control Theory
(20 Hours)
(Module ID 12204-03; from Instrumentation Level Two)
Trainee $19
Instructor $19

Process Control Loops and Tuning
(20 Hours)
(Module ID 40407-09; from Industrial Maintenance E&I Technician Level Four)
Trainee $19
Instructor $19

Data Networks
(15 Hours)
(Module ID 40408-09; from Industrial Maintenance E&I Technician Level Four)
Trainee $19
Instructor $19

Digital Logic Circuits
(10 Hours)
(Module ID 12401-03; from Instrumentation Level Four)
Trainee $19
Instructor $19

Calibrate Supervisory Instrumentation Elements
(10 Hours)
(Module ID 51401-10) Describes the sensing devices used to monitor key parameters, including vibration and speed sensors, eccentricity sensors, and thrust bearing wear detectors. Also covers the test instruments used to calibrate supervisory instrumentation, including shakers and Wobulators®, and explains how to use selected test instruments in the calibration process.

Boiler/HRSG Control
(12.5 Hours)
(Module ID 32401-09; from Industrial Maintenance Mechanic Level Four)
Trainee $19
Instructor $19

Preventive and Predictive Maintenance
(10 Hours)
(Module ID 32402-10) Covers the control devices, methods, and strategies used for boilers and Heat Recovery Steam Generators (HRSGs). Discusses fuel, air, oxygen, feedwater, and steam control, as well as the precautions and regulations related to burner and furnace fuel control.

Pneumatic Control Valves, Actuators and Positioners
(40 Hours)
(Module ID 40404-09; from Industrial Maintenance E&I Technician Level Four)
Trainee $19
Instructor $19

Performing Loop Checks
(7.5 Hours)
(Module ID 40405-09; from Industrial Maintenance E&I Technician Level Four)
Trainee $19
Instructor $19

Troubleshooting and Commissioning a Loop
(10 Hours)
(Module ID 40406-09; from Industrial Maintenance E&I Technician Level Four)
Trainee $19
Instructor $19

CURRICULUM NOTES

- 210 Hours
- Published: 2010
- Please note that these modules are drawn as is from various other craft areas. To order modules individually, refer to the specific craft page for ISBNs.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.
Power Generation Maintenance Mechanic

L1 POWER GENERATION MAINTENANCE MECHANIC

LEVEL 1

- 225 Hours (Includes 100 hours of Power Industry Fundamentals which is a prerequisite for Level 1 completion and must be purchased separately. See p. 86 for more information.)
- Published: 2010
- Includes full color insert
- Please note that these modules are drawn as is from various other craft areas. To order modules individually, refer to the specific craft page for ISBNs.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK ISBN

Trainee Guide: $67 978-0-13-215439-0

Product Supplements


MODULES

Tools of the Trade (5 Hours)
( Module ID 32102-07; from Industrial Maintenance Mechanic Level One)

Fastereners and Anchors (5 Hours)
( Module ID 32103-07; from Industrial Maintenance Mechanic Level One)

Oxyfuel Cutting (17.5 Hours)
( Module ID 32104-07; from Industrial Maintenance Mechanic Level One)

Gaskets and Packing (20 Hours)
( Module ID 32105-07; from Industrial Maintenance Mechanic Level One)

Craft-Related Mathematics (15 Hours)
( Module ID 32106-07; from Industrial Maintenance Mechanic Level One)
Instructor $19 ISBN 978-0-13-614568-4

Construction Drawings (12.5 Hours)
( Module ID 32107-07; from Industrial Maintenance Mechanic Level One)

Pumps and Drivers (5 Hours)
( Module ID 32108-07; from Industrial Maintenance Mechanic Level One)

Valves (5 Hours)
( Module ID 32109-07; from Industrial Maintenance Mechanic Level One)

Introduction to Test Instruments (7.5 Hours)
( Module ID 32110-07; from Industrial Maintenance Mechanic Level One)
Instructor $19 ISBN 978-0-13-614607-0

Material Handling and Hand Rigging (15 Hours)
( Module ID 32111-07; from Industrial Maintenance Mechanic Level One)

Mobile Support Equipment (10 Hours)
( Module ID 32112-07; from Industrial Maintenance Mechanic Level One)
Instructor $19 ISBN 978-0-13-614609-4

Lubrication (12.5 Hours)
( Module ID 32113-07; from Industrial Maintenance Mechanic Level One)

SMAW Equipment and Setup (5 Hours)
( Module ID 29107-09; from Welding Level One)

L2 POWER GENERATION MAINTENANCE MECHANIC

LEVEL 2

- 260 Hours
- Published: 2010
- Please note that these modules are drawn as is from various other craft areas. To order modules individually, refer to the specific craft page for ISBNs.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK ISBN

Instructor’s Guide: $94 978-0-13-215408-6

Product Supplements


MODULES

Basic Layout (20 Hours)
( Module ID 32201-07; from Industrial Maintenance Mechanic Level Two)
Instructor $19 ISBN 978-0-13-604668-4

Advanced Trade Math (30 Hours)
( Module ID 32301-08; from Industrial Maintenance Mechanic Level Three)
Instructor $19 ISBN 978-0-13-604656-1

Precision Measuring Tools (20 Hours)
( Module ID 32302-08; from Industrial Maintenance Mechanic Level Three)
Instructor $19 ISBN 978-0-13-604657-8

Introduction to Bearings (15 Hours)
( Module ID 32307-07; from Industrial Maintenance Mechanic Level Two)

Installing Bearings (20 Hours)
( Module ID 32303-08; from Industrial Maintenance Mechanic Level Three)

Installing Couplings (15 Hours)
( Module ID 32304-08; from Industrial Maintenance Mechanic Level Three)

Installing Mechanical Seals (20 Hours)
( Module ID 32308-08; from Industrial Maintenance Mechanic Level Three)

Conventional Alignment (30 Hours)
( Module ID 32306-08; from Industrial Maintenance Mechanic Level Four)

Reverse Alignment (30 Hours)
( Module ID 32404-09; from Industrial Maintenance Mechanic Level Four)

Laser Alignment (25 Hours)
( Module ID 32405-09; from Industrial Maintenance Mechanic Level Four)
Trainee $19 ISBN 978-0-13-610449-0

Installing Belt and Chain Drives (10 Hours)
( Module ID 32307-08; from Industrial Maintenance Mechanic Level Three)

Introduction to Piping Components (5 Hours)
( Module ID 32202-07; from Industrial Maintenance Mechanic Level Two)
Instructor $19 ISBN 978-0-13-604669-1

Copper and Plastic Piping Practices (5 Hours)
( Module ID 32303-07; from Industrial Maintenance Mechanic Level Two)
Power Generation Maintenance Mechanic Level 2 (continued)

Introduction to Ferrous Metal Piping Practices
(5 Hours)
(Module ID 32204-07; from Industrial Maintenance Mechanic Level Two)
Trainee $19
Instructor $19
ISBN 978-0-13-604624-0

Identify, Install and Maintain Valves (10 Hours)
(Module ID 32205-07; from Industrial Maintenance Mechanic Level Two)
Trainee $19
Instructor $19

Consists of:

Conveyors (5 Hours)
(Module ID 15401-08; from Millwright Level Four)
Trainee $19
Instructor $19

Troubleshooting and Repairing Conveyors
(12.5 Hours)
(Module ID 15402-08; from Millwright Level Four)
Trainee $19
Instructor $19

Basic Hydraulic Systems (10 Hours)
(Module ID 15409-08; from Millwright Level Four)
Trainee $19
Instructor $19

Troubleshooting and Repairing Hydraulic Equipment (7.5 Hours)
(Module ID 15410-08; from Millwright Level Four)
Trainee $19
Instructor $19

Motor-Operated Valves (15 Hours)
(Module ID 40313-09; from Industrial Maintenance E&I Technician Level Three)
Trainee $19
Instructor $19

Advanced Blueprint Reading (25 Hours)
(Module ID 32402-09; from Industrial Maintenance Mechanic Level Four)
Trainee $19
Instructor $19

Fuel Preparation and Delivery Equipment
(10 Hours)
(Module ID 32401-09; from Industrial Maintenance Mechanic Level Four)
Trainee $19
Instructor $19

Preventative and Predictive Maintenance
(25 Hours)
(Module ID 32402-10) Explains the basics of operations of a coal-fired boiler system. Describes the delivery processes from the storage yard into the coal preparation equipment, and from the equipment into the furnace. Addresses the maintenance checks that need to be made on coal delivery and preparation equipment and explains how solid fuel wastes are disposed of in coal-burning furnace systems. Describes how other solid-fuel furnaces, such as biomass furnaces, are used with boilers.

Introduction to Tube Work (10 Hours)
(Module ID 32212-07; from Industrial Maintenance Mechanic Level Two)
Trainee $19
Instructor $19

Compressors and Pneumatic Systems (35 Hours)
(Module ID 32403-09; from Industrial Maintenance Mechanic Level Four)
Trainee $19
Instructor $19

Troubleshooting and Repairing Pumps (10 Hours)
(Module ID 32407-09; from Industrial Maintenance Mechanic Level Four)
Trainee $19
ISBN 978-0-13-610452-0

Troubleshooting and Repairing Gearboxes (20 Hours)
(Module ID 32408-09; from Industrial Maintenance Mechanic Level Four)
Trainee $19

Setting Baseplates and Prealignment (30 Hours)
(Module ID 32305-08; from Industrial Maintenance Mechanic Level Three)
Trainee $19

Turbines (10 Hours)
(Module ID 15505-09; from Millwright Level Five)
Trainee $19
ISBN 978-0-13-610496-4

Maintaining and Repairing Turbine Components (15 Hours)
(Module ID 15506-09; from Millwright Level Five)
Trainee $19

L3 POWER GENERATION MAINTENANCE MECHANIC

LEVEL 3

Curriculum Notes
- 155 Hours
- Published: 2010
- Please note that these modules are drawn as is from various other craft areas. To order modules individually, refer to the specific craft page for ISBNs.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK
ISBN
Trainee Guide: $94
978-0-13-215409-3
Instructor’s Guide: $94
978-0-13-215410-9

Product Supplements
PowerPoint® Presentation Slides
$40

MODULES
Low-Pressure Steam Systems (10 Hours)
(Module ID 32208-07; from Industrial Maintenance Mechanic Level Two)
Trainee $19
Instructor $19

High-Pressure Steam Systems and Auxiliaries (20 Hours)
(Module ID 32209-07; from Industrial Maintenance Mechanic Level Two)
Trainee $19
Instructor $19

Heaters, Furnaces, Heat Exchangers, Cooling Towers and Fin Fans (30 Hours)
(Module ID 32211-07; from Industrial Maintenance Mechanic Level Two)
Trainee $19
Instructor $19

Hydrostatic and Pneumatic Testing (10 Hours)
(Module ID 32206-07; from Industrial Maintenance Mechanic Level Two)
Trainee $19
Instructor $19

Installing Fans and Blowers (10 Hours)
(Module ID 15312-08; from Millwright Level Three)
Trainee $19
Instructor $19

L4 POWER GENERATION MAINTENANCE MECHANIC

LEVEL 4

Curriculum Notes
- 165 Hours
- Published: 2010
- Please note that these modules are drawn as is from various other craft areas. To order modules individually, refer to the specific craft page for ISBNs.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK
ISBN
Trainee Guide: $94
978-0-13-215411-6
Instructor’s Guide: $94
978-0-13-215412-3

Product Supplements
PowerPoint® Presentation Slides
$40

MODULES
Vibration and Balancing (12.5 Hours)
(Module ID 52401-10) Reviews machine basics and explains the causes of machine vibrations. Reviews the basics of vibration analysis and covers the devices used to detect and analyze vibration signatures. Explains how and why vibration analysis is used as part of predictive maintenance programs. Describes field machine balancing.
Trainee $19
Instructor $19
L1 POWER LINE WORKER

Curriculum Notes

- 402.5 Hours (Includes 100 hours of Power Industry Fundamentals, which is a prerequisite for Level 1 completion and must be purchased separately. See p. 86 for more information.)
- Published: 2011
- Trainee Guide and individual trainee modules are full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK ISBN
Trainee Guide: $67 978-0-13-257109-8

Product Supplements

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.

Power Line Worker Safety (22.5 Hours)
(Module ID 49102-11) Covers the safety equipment and safety practices associated with the special hazards of power line work, including electrical and arc flash hazards; traffic control; trenching; horizontal directional drilling; working in confined spaces; and safe entry into a substation.

Introduction to Electrical Circuits (7.5 Hours)
(Module ID 49103-11) Provides a general introduction to electricity and DC circuits, including theory of voltage, current and resistance, basic DC circuits, and Ohm’s law. Also introduces the test equipment used in power line work.

Introduction to Electrical Theory (7.5 Hours)
(Module ID 49104-11) Describes how to calculate voltage, current, and resistance values in series, parallel, and combination DC circuits using Ohm’s law. Also includes a basic description of grounding and bonding.

Climbing Wooden Poles (80 Hours)
(Module ID 49105-11) Describes how to safely climb a wooden utility pole. Covers climbing equipment, inspection of equipment, pole inspection, climbing techniques, and pole-top rescue.

Climbing Structures Other Than Wood

(40 Hours)
(Module ID 49106-11) Explains the equipment, safety practices, and climbing techniques required to climb towers. Hazards associated with the environment, such as snakes, birds, insects, and weather hazards, are also covered.

Tools of the Trade (10 Hours)
(Module ID 49107-11) Covers the specialized tools used by line workers, including hot sticks, as well as universal tool accessories. Also covers ladders and work platforms; clippers; cable cutters; pneumatic tools; and powder-actuated tools.

Aerial Framing and Associated Hardware

(80 Hours)
(Module ID 49108-11) Provides descriptions and operations instructions for use of the derricke, bucket truck, crane truck, and aerial lift. Also covers safety requirements; inspection and maintenance; driving and setup operations; and emergency procedures.

Rigging (12.5 Hours)
(Module ID 49110-11) Explains how to install guys to support a utility pole, as well as how to install the equipment on the pole to support conductors. Includes the installation of cross-arms, transformers, and conductors.

Utility Service Equipment

(15 Hours)
(Module ID 49109-11) Provides descriptions and operations instructions for use of the derricke, bucket truck, crane truck, and aerial lift. Also covers safety requirements; inspection and maintenance; driving and setup operations; and emergency procedures.

Setting and Pulling Poles (20 Hours)
(Module ID 49111-11) Provides instructions for the storage, loading, and transport of wooden utility poles. Includes use of the derricke to dig the hole and install the pole. Also covers pole removal using a hydraulic jacking device.

Trenching, Excavating, and Boring Equipment

(7.5 Hours)
(Module ID 49112-11) Covers the use and maintenance of trenching equipment, backhoe/loaders, and horizontal directional drilling equipment for the installation of direct-buried power lines. Includes a review of safety guidelines related to buried utilities.

Introduction to Electrical Test Equipment

(7.5 Hours)
(Module ID 49113-11) Introduces the basic test equipment used by electrical workers to test and troubleshoot electrical circuits. Also covers specialized line worker test equipment, including the high-voltage detector, phase rotation tester, megohmmeter, phasing stick, and hi-pot tester.

L2 POWER LINE WORKER: DISTRIBUTION

Curriculum Notes

- 157.5 Hours
- Published: 2011
- Trainee Guide and trainee modules are in full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK ISBN
Instructor’s Guide: $94 978-0-13-274329-7

Product Supplements

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.

Alternating Current and Three-Phase Systems

(17.5 Hours)
(Module ID 80201-11) Introduces the development of both single- and three-phase alternating current. Analyzes the relationship of AC phases and introduces key components used to refine AC power. Discusses the operation of transformers and introduces trainees to advanced AC concepts such as reactive power and the power factor.

Aerial Distribution Equipment

(25 Hours)
(Module ID 80202-11) Identifies the various equipment components found on overhead distribution system poles and describes the function of each, including transformers, reclosers, fuses, sectionalizers, capacitor banks, and voltage regulators.

To Order Call: 1-800-922-0579
Stay Connected: 
www.nccer.org/bookstore
Cable and Conductor Installation and Removal
(20 Hours)
(Module ID 80203-11) Describes the types of conductors and cables used in overhead and underground distribution systems and the equipment and procedures used to install and remove them. Includes methods used to splice conductors.

Underground Residential Distribution (URD) Systems (30 Hours)
(Module ID 80204-11) Describes the methods used to distribute power in residential and commercial subdivisions, including the equipment used in the process, such as pad-mount transformers and switchgear. The module covers the components and methods used to connect primary and secondary power, as well as the protective devices used in URD systems and methods used to locate and repair buried cables.

Overhead and URD Service Installations (15 Hours)
(Module ID 80205-11) Describes the methods and procedures used in terminating single-phase and three-phase aerial and URD systems at residential and commercial customer locations. Includes coverage of revenue meters and street light connections.

Distribution Line Maintenance (50 Hours)
(Module ID 80206-11) Describes the inspection process and the methods and procedures used to inspect and maintain poles, conductors, and equipment used in aerial and URD systems. Includes coverage of transformer testing; location and correction of faults in URD systems; load management systems; and protective device coordination.

Power Line Worker: Distribution Level Two

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.

Introduction to Substations (10 Hours)
(Module ID 82201-12; from Power Line Worker: Substation Level Two)

Live Line Work (40 Hours)
(Module ID 80301-12) This module covers the tools such as hot sticks, shot gun sticks, and wire tongs, along with the PPE and safe work practices that are critical elements of live line and bare hand work. The module includes coverage of the various live line tasks such as different methods of moving conductors and replacing insulators, cross-arms, and poles.

Three-Phase URD Systems (25 Hours)
(Module ID 80302-12) This module covers safety practices associated with three-phase URD systems, describes vault and manhole applications, and describes different transformer configurations and sectionalizing equipment used in three-phase URD systems. It also covers three-phase cables and how cable is pulled through conduit.

System Protection and Monitoring (7.5 Hours)
(Module ID 80303-12) Presents an overview of monitoring and protection systems and reviews the key components that make them work. Feeder diagrams and their use in locating and identifying components is also covered.

Troubleshooting (40 Hours)
(Module ID 80304-12) Focuses on the methods used to safely locate and correct faults in aerial and URD systems. It includes troubleshooting methods as well as work site preparation.

Introduction to Smart Grid (2.5 Hours)
(Module ID 80305-12) Describes the network of transmission and distribution lines that delivers electricity between generating sources and consumers and explains how the smart grid oversets this network to maintain a balance between power availability and demand.

Fundamentals of Crew Leadership (20 Hours)
(Module ID 46101-11)

Managing Electrical Hazards (12.5 Hours)
(Module ID 26501-12; from Electrical)
Instructor S22 ISBN 978-0-13-294917-0

Alternating Current and Three-Phase Systems (17.5 Hours)
(Module ID 80201-12; from Power Line Worker: Distribution Level Two)

Conductors and Cables (10 Hours)
(Module ID 82202-12) Identifies the many types, sizes, and applications of conductors and cables. Fiber-optic cable is also introduced. Reviews the use of cable drawings and schedules. Provides coverage of the methods of routing cables underground in the substation environment.
Power Line Worker: Substation Level 2 (continued)

L3 POWER LINE WORKER: SUBSTATION

Curriculum Notes

- 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.

Temporary Grounding (15 Hours)
(Module ID 40308-09; from Industrial Maintenance E&I Level Three)
Trainee $19
Instructor $19
ISBN 978-0-13-604738-4

Advanced Drawing Reading (20 Hours)
Trainee $19
Instructor $19

Medium- and High-Voltage Equipment Installation (25 Hours)
Trainee $19
Instructor $19
ISBN 978-0-13-296792-1

Contractor House (20 Hours)
Trainee $19
Instructor $19

Connectors, Conductor Terminations, and Splicing (25 Hours)
Trainee $19
Instructor $19
ISBN 978-0-13-296801-0
(Module ID 82304-12) Describes the procedures and materials required to prepare and complete terminations and splices on insulated and non-insulated conductors and cables. Coverage is provided for both medium- and high-voltage circuits. Hydraulic presses and crimpers are introduced, along with hi-pot testing procedures for terminations and splices.

Equipment Testing, Troubleshooting, and Maintenance (30 Hours)
Trainee $19
Instructor $19
(Module ID 82305-12) Identifies the testing procedures required and explains how to properly maintain substation components. Coverage of testing and maintenance procedures is provided for power transformers, potential devices, various circuit breakers, disconnects and switches, capacitors, and reactors.

System Protection and Control (12.5 Hours)
Trainee $19
Instructor $19
(Module ID 82306-12) Describes the protective functions required in the substation environment to defend against overloads, fault currents, and other incidents that can disrupt service or damage the system. Offers coverage of the components used to provide both protection and system control. An introduction to the various protective relay schemes used in today’s substations is included.

Fundamentals of Crew Leadership (20 Hours)
Trainee $40
Instructor $40

L2 POWER LINE WORKER: TRANSMISSION

Curriculum Notes

- 175 Hours
- Published: 2011
- Trainee Guide and trainee modules are in full color.
- Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from www.nccerirc.com.

PAPERBACK

Product Supplements:
PowerPoint® Presentation Slides
$40
## Power Line Worker: Transmission Level 2 (continued)

### 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.

#### Alternating Current and Three-Phase Systems

<table>
<thead>
<tr>
<th>Module ID</th>
<th>ISBN (Trainee)</th>
<th>ISBN (Instructor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80201-11</td>
<td>978-0-13-274259-7</td>
<td>978-0-13-274266-5</td>
</tr>
</tbody>
</table>

**Trainee**

- **Power Line Worker: Distribution Level Two**

**Instructor**

- **Power Line Worker: Distribution Level Two**

#### Transmission Structure Rigging

<table>
<thead>
<tr>
<th>Module ID</th>
<th>ISBN (Trainee)</th>
<th>ISBN (Instructor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>81201-11</td>
<td>978-0-13-296770-9</td>
<td>978-0-13-296771-6</td>
</tr>
</tbody>
</table>

**Trainee**

- **Transmission Structure Rigging**

**Instructor**

- **Transmission Structure Rigging**

#### Transmission Equipment Installation

<table>
<thead>
<tr>
<th>Module ID</th>
<th>ISBN (Trainee)</th>
<th>ISBN (Instructor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>81203-11</td>
<td>978-0-13-294910-1</td>
<td>978-0-13-294920-0</td>
</tr>
</tbody>
</table>

**Trainee**

- **Transmission Equipment Installation**

**Instructor**

- **Transmission Equipment Installation**

#### Transmission System Maintenance

<table>
<thead>
<tr>
<th>Module ID</th>
<th>ISBN (Trainee)</th>
<th>ISBN (Instructor)</th>
</tr>
</thead>
</table>

**Trainee**

- **Transmission System Maintenance**

**Instructor**

- **Transmission System Maintenance**

#### Construction, Maintenance & Repair – Live-line Barehand

<table>
<thead>
<tr>
<th>Module ID</th>
<th>ISBN (Trainee)</th>
<th>ISBN (Instructor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>81301-12</td>
<td>978-0-13-296772-3</td>
<td>978-0-13-296776-1</td>
</tr>
</tbody>
</table>

**Trainee**

- **Construction, Maintenance & Repair – Live-line Barehand**

**Instructor**

- **Construction, Maintenance & Repair – Live-line Barehand**

#### Re- Conductoring Transmission Lines

<table>
<thead>
<tr>
<th>Module ID</th>
<th>ISBN (Trainee)</th>
<th>ISBN (Instructor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>81302-12</td>
<td>978-0-13-296775-4</td>
<td>978-0-13-296778-5</td>
</tr>
</tbody>
</table>

**Trainee**

- **Re- Conductoring Transmission Lines**

**Instructor**

- **Re- Conductoring Transmission Lines**

#### Construction, Maintenance & Repair – Hot Stick

<table>
<thead>
<tr>
<th>Module ID</th>
<th>ISBN (Trainee)</th>
<th>ISBN (Instructor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>81303-12</td>
<td>978-0-13-296773-7</td>
<td>978-0-13-296777-8</td>
</tr>
</tbody>
</table>

**Trainee**

- **Construction, Maintenance & Repair – Hot Stick**

**Instructor**

- **Construction, Maintenance & Repair – Hot Stick**

#### Lift Planning

<table>
<thead>
<tr>
<th>Module ID</th>
<th>ISBN (Trainee)</th>
<th>ISBN (Instructor)</th>
</tr>
</thead>
</table>

**Trainee**

- **Lift Planning**

**Instructor**

- **Lift Planning**

---

**POWER LINE WORKER: TRANSMISSION LEVEL 3**

<table>
<thead>
<tr>
<th>Curriculum Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>220 Hours</td>
</tr>
<tr>
<td>Published: 2012</td>
</tr>
<tr>
<td>Trainee Guide and trainee modules are in full color.</td>
</tr>
<tr>
<td>Instructor’s Guide includes access code to download TestGen software, module exams, and performance profile sheets from <a href="http://www.nccerirc.com">www.nccerirc.com</a>.</td>
</tr>
</tbody>
</table>

**PAPERBACK**

- **Instructor’s Guide:** $94 ISBN 978-0-13-294920-0

**PowerPoint® Presentation Slides**

- **ISBN 978-0-13-294910-1**

- **$40**

---

**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.
The Safety Learning Series consists of three separate titles comprising a suggested education path: Safety Orientation, Field Safety, and Safety Technology. The 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 Safety Learning Series has been recognized by the Council on Certification of Health, Environmental, and Safety Technologists (CCHEST). Completion of the Safety Learning Series will help personnel prepare for the Safety Trainer (STS) and Construction Health and Safety Technologist (CHST) certification exams administered by CCHEST. CHST is a joint venture of the Board of Certified Safety Professionals and the American Board of Industrial Hygiene.

Confined Spaces and Excavations (5 hours)
Trainee $19
Instructor $19
(75120-13) Covers safety precautions related to work in confined spaces, including the responsibilities and duties of each member of the confined-space entry team. It also covers the safety hazards and safeguards required when working in an excavation, including an explanation of various trenching supports and soil types.

Electrical Safety (5 hours)
Trainee $19
Instructor $19
(75121-13) Describes the basic precautions necessary to avoid electrical shock, arc, and blast hazards. It also describes the lockout/tagout procedure.

Working from Elevations (5 hours)
Trainee $19
Instructor $19
(75122-13) Explains the use of fall-protection equipment. It also covers safety precautions related to elevated work surfaces, including ladders, scaffolding, and aerial lifts.

Heavy Equipment, Forklifts, and Cranes (5 hours)
Trainee $19
Instructor $19
ISBN 978-0-13-382410-0
(75123-13) Covers the safety hazards and precautions necessary when working near heavy equipment. It also covers the general safety requirements for the use of forklifts and cranes.

Introduction to Materials Handling (5 hours)
Trainee $19
Instructor $19
(75124-13) Explains the safety precautions required when transporting, handling, rigging, stacking, and storing various types of loads. It also covers safe lifting procedures.

To Order Call: 1-800-922-0579
www.nccer.org/bookstore
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) ISBN

VOLUME 1

Introduction to Safety Technology (2.5 Hours)
(Module ID 75201-03) Describes the roles and responsibilities of the safety technician. Explains three levels of accident causation, accident cost impact, safety program components, and government regulatory requirement impact on the construction industry.

Hazard Recognition, Evaluation, and Control (2.5 Hours)
(Module ID 75202-03) Presents techniques used to recognize hazards, unsafe acts, and unsafe conditions on the job site. Explains how to evaluate acceptable job-site risk levels and introduces the seven major methods of hazard control.

Risk Analysis and Assessment (2.5 Hours)
(Module ID 75203-03) Focuses on the relationship between human behavior and work-site safety. Describes the factors involved in performance analysis and the techniques used to coach and counsel workers with performance problems.

Inspections, Audits, and Observations (2.5 Hours)
(Module ID 75204-03) Introduces the roles and responsibilities of the safety technician with regard to on-site inspections, audits, and observations. Explains the purpose of safety inspections and how to properly conduct safety audits and employee observations.

VOLUME 2

Employee Motivation (2.5 Hours)
(Module ID 75205-03) Stresses the importance of effectively communicating safety policies and procedures to all employees on the job site. Discusses how to provide employee recognition, discipline, and motivation.

Site-Specific ES&H Plans (2.5 Hours)
(Module ID 75206-03) Environmental Safety and Health (ES&H) plans must be modified to meet job-specific conditions. Explains how to make these modifications, coordinate implementation of ES&H plans, identify job-specific hazards and requirements using pre-bid checklists, and evaluate hazard risks.

Emergency Action Plans (2.5 Hours)
(Module ID 75207-03) Focuses on the basics of emergency action plans and media communications.

JSAs and TSAs (2.5 Hours)
(Module ID 75208-03) Covers the purposes of and differences between job safety analyses and task safety analyses. Explains how to properly conduct safety analyses.

VOLUME 3

Safety Orientation and Training (2.5 Hours)
(Module ID 75209-03) Covers the basics of safety training program coordination as it teaches participants to effectively implement safety training.

Work Permit Policies (2.5 Hours)
(Module ID 75210-03) Focuses on the roles and responsibilities of the safety technician with regard to work permit policies. Discusses safety technicians’ permit-related roles in hot work, confined-space work, excavation work, electrical hot work, and lockout/tagout procedures.

Confined-Space Entry Procedures (2.5 Hours)
(Module ID 75211-03) Stresses the safety requirements of confined-space work. Describes permit, entry, emergency, and rescue procedures. Also covers the main types of atmospheric hazards and the procedures used for testing for them in confined spaces.

Safety Meetings (2.5 Hours)
(Module ID 75212-03) Explains how to effectively communicate safety issues and concerns to workers through safety meetings. Presents methods for using safety meetings to implement corrective actions to unsafe practices and behavior.

VOLUME 4

Accident Investigation: Policies and Procedures (2.5 Hours)
(Module ID 75213-03) Explains the connection between accident investigation and accident prevention and describes the purposes and uses of accident investigations. Teaches participants to properly conduct accident investigation interviews and fill out related forms.

Recordkeeping (2.5 Hours)
(Module ID 75215-03) Accurate record keeping 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.

OSSA Inspection Procedures (2.5 Hours)
(Module ID 75216-03) Focuses on the safety technician’s role during OSHA inspections. Covers the process and purpose of OSHA site inspections. Explains 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.

ES&H Data Tracking and Trending (2.5 Hours)
(Module ID 75217-03) Describes the traditional and proactive methods of measuring safety performance. Participants learn to analyze data to identify safety program strengths and isolate areas needing improvement.

Environmental Awareness (2.5 Hours)
(Module ID 75218-03) Introduces ways to minimize hazardous-waste production and prevent water and soil contamination. Covers 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.

VOLUME 5

OSHA Inspection Procedures (2.5 Hours)
(Module ID 75216-03) Focuses on the safety technician’s role during OSHA inspections. Covers the process and purpose of OSHA site inspections. Explains 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.

ES&H Data Tracking and Trending (2.5 Hours)
(Module ID 75217-03) Describes the traditional and proactive methods of measuring safety performance. Participants learn to analyze data to identify safety program strengths and isolate areas needing improvement.

Environmental Awareness (2.5 Hours)
(Module ID 75218-03) Introduces ways to minimize hazardous-waste production and prevent water and soil contamination. Covers 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.
Your students are spending the time to get the right training, now make sure they get the credentials they deserve.

NCCER’s standardized curriculum leads to industry-recognized credentials and successful careers in the construction industry.

Credentials Matter.

nccer.org
1.888.622.3720
HELP YOUR STUDENTS BUILD MORE THAN A CAREER, HELP THEM BUILD A LIFE.

The construction industry is looking for bright, young skilled professionals to help fill the skills gap. Your students can be those people. Construction offers fantastic pay, great benefits and exciting career opportunities with plenty of room for advancement.

Help your students get the career of their dreams. Visit BYF.ORG to view our online resources, including digital craft trading cards and an interactive career path.

David Bates, 32
Project Manager
The Haskell Company
4 EASY WAYS TO ORDER!

1. Online using OASIS
   24 hours, 7 days a week
   Pearson offers a free online Order and Shipment Information System (OASIS) that allows you to place orders, track shipments and manage your account online.
   http://oasis.pearson.com
   • Place Orders and receive same-day shipping on all orders placed before 12:00ET
   • Track orders; OASIS links to 20+ carriers
   • Check prices and availability and access product information
   • Receive order & shipment confirmations via email
   • Manage your account-view or request invoices, credit memos and statements
   • View or request custom reports for order status, unshipped orders, new editions, backorders, tracking reports and more
   • Copy and paste up to 500 lines at one time from your spreadsheet into OASIS
   • Use a credit card or a purchase order
   • Place drop-ship orders (one-time ship location)
   • Build and save multiple shopping carts for ordering flexibility

For more information on OASIS visit http://oasis.pearson.com. For OASIS Technical Support call 800-850-9124 or email oasis@pearson.com.

2. Phone
   Toll-free 800-922-0579

3. Fax
   Toll-free 800-445-6991

4. Mail
   Send Purchase Orders to:
   Pearson Higher Education Order Department
   P.O. Box 3039
   Lebanon, IN 46052

How Individuals May Order
Orders from individuals are welcome but must be prepaid by credit card (VISA, MasterCard and Discover accepted), check or money order. Individual pricing is list price, not reflected in this catalog.

Individual Ordering Department: 800-947-7700
Check out the “online catalog” at www.nccer.org.

Module Orders
Individual modules are printed on demand. Please allow 2 to 3 weeks for fulfillment and delivery. Modules are not returnable.

Pricing
All prices listed in this catalog reflect net pricing available to schools, government, business and industry accounts. No additional discounts are available. Prices are subject to change without notice.

Shipping and Postage
Shipping costs are based on a number of factors including weight, destination and type of service. All orders are subject to approximately 8-10% shipping cost on total order. State and local taxes will be added where they apply.

Returns Policy
If you are not entirely satisfied with any of our textbooks, you may return materials including paperback, looseleaf and binder in saleable condition for a full refund, credit or replacement within 15 months of the original invoice date (12 months for high school accounts). All packages must be returned complete as sold. Individual modules are printed on demand and are not returnable. There is no restocking fee for returning eligible materials to Pearson. Returns Address: Pearson Education Returns Facility, 258 Prospect Plains Rd. Cranbury NJ 08512.

High School/ Secondary Institutions
Send Purchase Orders to:
Pearson Curriculum Division
PO Box 2500
Lebanon, IN 46052-3009
Phone: 800-848-9500 • Fax: 877-260-2530
Please note: Remember to clearly mark “CONFIRMATION” on any paper copy of a phone or faxed-in order.

For more information on OASIS visit http://oasis.pearson.com. For OASIS Technical Support call 800-850-9124 or email oasis@pearson.com.

Damaged Materials Policy
If you receive incorrect or damaged/defective materials, please call Pearson Customer Service at 800-922-0579 (High Schools call 800-445-9500) to make arrangements for returns, replacement and/or credit. Customer Service also handles questions on credit memos/credits.

Payment Terms
Net 30 days.

Billing
Invoices are generated only after items have shipped. You may receive multiple invoices on one purchase order if items are backordered and/or not yet published. Drop shipments to other locations are accompanied by a packing slip. This is not an invoice and should not be paid. Only the “Bill to” account will be invoiced.

OASIS Punchout
Do you currently punchout with any of your vendors via an eProcurement module within a system such as PeopleSoft, Oracle, or SAP? Pearson has the capability to receive orders electronically from customers who are operating on any system that uses the eCommerce standard for system-to-system ordering known as CXJML. If your purchasing system supports system-to-system ordering and you would like to work with Pearson to streamline the ordering process, please contact us at oasis@pearson.com.

Sign up today to receive your Pearson Higher Ed Documents via Email!
It’s Fast
• Invoices, Credits, Statements, and Acknowledgements (backorders, cancellations, etc) can be received via email.

It’s Flexible
• Each of these documents can be sent to a different email address based on your needs. You can mix and match — add an email address to any or all of these documents to customize the delivery method that suits you best.

It’s Easy
• Just fill out and fax the registration form found at oasis.pearson.com. Look for the electronic documents link on our Landing page.

Pearson Credit Department
For payment inquiries, call the Credit Department at 800-634-2863 and speak with your state specific credit rep.

Pearson Education Technology Support
Toll-free: 800-677-6337

International Orders
Pearson Education is the world’s leading education company with offices in more than 55 countries around the world. For information on how to order visit our “International Customers” section at www.pearsoned.com. Tel: 800-635-3889 or 201-767-5021 e-mail: intlcs@pearsoned.com

Pearson Higher Education Documents via Email!
It’s Fast
• Invoices, Credits, Statements, and Acknowledgements (backorders, cancellations, etc) can be received via email.

It’s Flexible
• Each of these documents can be sent to a different email address based on your needs. You can mix and match — add an email address to any or all of these documents to customize the delivery method that suits you best.

It’s Easy
• Just fill out and fax the registration form found at oasis.pearson.com. Look for the electronic documents link on our Landing page.

Pearson Credit Department
For payment inquiries, call the Credit Department at 800-634-2863 and speak with your state specific credit rep.

Pearson Education Technology Support
Toll-free: 800-677-6337

International Orders
Pearson Education is the world’s leading education company with offices in more than 55 countries around the world. For information on how to order visit our “International Customers” section at www.pearsoned.com. Tel: 800-635-3889 or 201-767-5021 e-mail: intlcs@pearsoned.com
CREDENTIALS MATTER

Your students are spending the time to get the right training, now make sure they get the credentials they deserve.

Find out how you can offer NCCER’s industry recognized, portable credentials that owners and contractors look for by visiting nccer.org.

- ACT
- American Fire Sprinkler Association
- Associated Builders and Contractors, Inc.
- Associated General Contractors of America
- Association for Career and Technical Education
- Association for Skilled and Technical Sciences
- Carolinas AGC, Inc.
- Carolinas Electrical Contractors Association
- Center for the Improvement of Construction Management and Processes
- constructNET International, Inc.
- Construction Industry Institute
- Construction Users Roundtable
- Construction Workforce Development Center
- Design Build Institute of America
- Gulf States Shipbuilders Consortium
- ISN Software Corporation
- Judgment Index™ River City Group
- Manufacturing Institute
- Mason Contractors Association of America
- Merit Contractors Association of Canada
- NACE International
- National Association of Minority Contractors
- National Association of Women in Construction
- National Insulation Association
- National Ready Mixed Concrete Association
- National Technical Honor Society
- National Utility Contractors Association
- NAWIC Education Foundation
- North American Crane Bureau
- North American Technician Excellence
- Painting & Decorating Contractors of America
- Pearson
- Pearson International/Edexcel
- Portland Cement Association
- Prov
- SkillsUSA
- Steel Erectors Association of America
- U.S. Army Corps of Engineers
- University of Florida, M.E. Rinker School of Building Construction
- Women Construction Owners & Executives, USA