Table of Contents

Programmable Logic Controllers

CNC Courses

The Hane – Client Relationship

Our Commitment to You

Hane Training's goal is to provide you, our customer, with effective training which, when employed on the job, will help you **decrease** maintenance and operational costs and **increase** your quality and productivity. To accomplish our goal we make the following commitments to you:

1. *You will be provided with an instructor who is an experienced troubleshooter in the subject he teaches and who is certified in effective Hane training methodology.*

2. *Every participant will have at least 50% hands-on activities in a workshop.*

3. *Every participant will receive a customized workbook for each course they take. This is not a conventional textbook, but rather a specialized tool designed to actively engage the participants in the workshop, and which makes a particularly suitable "job aid" while troubleshooting on the job.*

4. *All participants who successfully complete the workshop will receive a "Certificate of Achievement" with the appropriate Continuing Education Units (CEU).*

5. *You will receive telephone assistance prior to the workshop to customize the training to suit your exact need and after the training for reinforcement of learning.*

6. *You may videotape the workshop for later retrieval of information by the participants.*

7. *Your operations will be unaffected by Hane during the training – we bring in all our own equipment.*

Unconditional Guarantee

We are so confident that you will benefit from Hane Training, that we offer you an unconditional guarantee of satisfaction. If for any reason you are dissatisfied with the training, and if there is nothing that we can do to remedy the problem to your satisfaction, you will owe us nothing. **No questions asked!**

On-Site Delivery

On-site training has several of the following distinct advantages over other forms of training.

- You save thousands of dollars in travel and per diem costs.

- You have the opportunity to train more people on-site than you could in a public workshop at a lower cost.

- You can customize on-site courses to better suit your plant needs.

- You need not worry about participants unintentionally discussing company proprietary information if the training is confined to your facility.

- You can have an integrated program developed with several courses to meet your specific needs.

- You and your participant's supervisors have the opportunity to sit in on the training – to see what the students are really learning.

- You have a live instructor to answer questions and interact with you and your participants.

Team Based Environment

In accordance with Hane's mission to provide you with total solutions to your training needs. It is very important that we understand your needs and problems before we present you a potential solution.

To achieve your solution multiple people may communicate with you. Every customer has at least one training coordinator, one technical specialist and a member of management at their disposal.

This team is a very powerful combination capable of providing input from all aspects of Hane to ensure that we can provide you an all-inclusive solution to your need.

The Hane Quality Stamp of Approval

Instructor Training Process

New instructor candidates must undergo a rigorous **three-month** training program in course content and Hane methodology.

1. 1 week in orientation and receiving instruction on Hane methodology.

2. 2 weeks in field viewing Hane workshops presented by certified instructors.

3. 2 weeks practicing techniques – including video taping which is critiqued by a professional development team (PDT).

- Instructor candidate will not proceed to the next phase until the PDT is satisfied that he/she is ready.

4. *"The Dry Run"* **–** the instructor candidate delivers portions of a workshop before various Hane colleague.

- If the instructor candidate satisfactorily passes *"The Dry Run"* he/she may proceed to the next phase.

5. *"The Wet Run"* **–** the instructor candidate delivers portions of a workshop in the field. Another certified instructor is present.

- If the instructor candidate's delivery is satisfactory he/she is allowed to gradually deliver larger and larger portions of the workshop.

- This phase normally takes 3 to 4 weeks to complete.

- **A candidate may never proceed to the next phase until they are completely ready.**

6. *"The Solo Run"* **–** the instructor candidate assumes the role of an instructor and delivers an entire workshop to a client. An additional certified instructor acts as an assistant to ensure no problems.

Only those candidates' who successfully complete this program become a certified Hane instructor and only in the course that he/she trained for.

Third Party Endorsements

The International Association for Continuing Education and Training (IACET)

IACET is the caretaker of the Continuing Education Units (CEU). Achieving IACET's organizational certification gives our customers several assurances. First of all, every course at Hane has CEU awarded upon completion. Secondly it ensures our customers that we are devoted to the improvement of the quality and effectiveness of continuing education, training and human resource development.

The American Council on Education (ACE)

A team of college faculty members representing ACE ascertained after a rigorous evaluation of the content and delivery of Hane courses and of our company management processes that many of our courses are equivalent to college level courses. The team recommended that the courses be approved for college transfer credit under ACE's College Credit Recommendation Service.

Any time you see ACE in the upper right corner of the page – you know that this course is ACE approved. All the student has to do is ask for ACE, give their social security number as a unique identifier and score at least a 70% on the post-test.

You benefit by having the opportunity to provide training for your employees that has recommended college transfer credit. With an ACE approved course there are many benefits you can receive. Employers can save tuition costs in assisting their employees with college education. This gives employees an additional company benefit, confirms employers' interest in their welfare, and encourages them to pursue formal post-secondary education, which provides you with a higher quality workforce – and at no additional cost! Your employee's benefit by being offered the opportunity to earn college credits while receiving company sponsored training, which gives them opportunities for growth, development, and advancement.

Methodology of Hane Training

Hane training is designed to ensure that learning occurs. Hane does not leave the learning process to chance. Everything that takes place in a Hane workshop has a carefully thought out purpose and was designed to actively engage participants in the training. One of the key reasons that Hane training has proven to be so effective over the years is the method of instruction that we employ in our training. Hane training has proven to be effective because it takes into consideration the full range of human faculties that can be utilized in the learning process – audio, visual, and kinesthetic.

The main goal of Hane training is to teach participants to effectively and efficiently troubleshoot and correct problems encountered in our clients' equipment. The Hane methodology, with which an Hane instructor must be proficient, has proven to be very successful in accomplishing this.

The Socratic instructional method

This requires the instructor to use skillfully formulated questions to lead the students to predetermined conclusions regarding knowledge of the basics of the subject as well as the use of troubleshooting techniques and repair procedures that apply to the subject.

Periodic review employed to reinforce learning

An appropriate use of repetition has proven time and again to facilitate learning, and if used properly, it allows the materials being presented to be referenced back and tied in with previously covered materials.

At least fifty percent Hands-on

Hane instructors are skilled at teaching students how to use various testing instruments to troubleshoot problems on lab trainers designed by Hane to closely simulate problems found in equipment on the plant floor. Even the discussion portions of the training are highly interactive while the instructor is demonstrating topics; the students are taking measurements and making calculations in their workbooks.

Liberal use of audio-visual aids

The instructors use overhead projectors to display every page as the class moves through the workbook. The workbooks then become particularly suitable job aids for retrieval of information by students while on the job later.

Hane training is enjoyable

Our experience has taught us that the students in our workshops learn best when they enjoy the training; therefore, we do everything possible to make the training fun.

In addition to making them proficient troubleshooters and repairmen, training that is fun produces these additional benefits for students: it reduces their fear and anxiety; it builds their self-confidence; it improves their attitudes; and it permits them to enjoy success.

Effectively trained employees contribute to an increase in the bottom line. We accomplish our mission when we help our clients reduce operational and maintenance costs and increase quality and productivity, and as a result help them to be more competitive and profitable.

Course Numbering System

Hane course numbers have two parts: a two-character department code followed by a three-digit number. The first of the three-digit number represents the level of difficulty, background or prerequisites needed.

For example:
EE 101 – *Electrical Controls* is a fundamental electrical course, which anyone may take.
EE 201 – *Industrial Electronics Maintenance Level One* is more challenging and requires background knowledge.

EE - Electrical / Electronics
FM - Facilities Maintenance
FP - Fluid Power
HS - Health & Safety
ME - Mechanical
NC - Computer Numerical Control (CNC)
PL - Programmable Logic Control (PLC)
PM - Predictive Maintenance

100 - Fundamental
200 - Intermediate
300 - Specialized
400 - Advanced

Our Most Valued Source of Information...You!

Our goal is to develop and maintain long term relationships by delivering customer focused training that meets or exceeds your expectations. How do we fill such a tall order? The answer is actually very simple, we listen to you.

We welcome and appreciate your input. We use your suggestions and comments in the evaluation, modification, and development of our products and services. We are eager to hear from you. You may submit your comments and suggestions to our web site at www.hanetraining.com, or via email to your customer representative, or contact us toll free at 1-800-777-0753.

Course Development

Our most successful courses have been those in which the customers participated in the development process. If you have a need that we do not address with an existing course offering, we would like to know. It may be a course that we are planning to develop and your input could play an important role in determining the content.

Course Improvement and Enhancement

Through student evaluations, contact reports and customer feed back, we determine necessary modifications and enhancements to our courses. Some of these improvements include updating our training equipment. We strive to provide lab activities that facilitate the most accurate hands-on, real world experience possible. Frequently, we update our course content and materials to respond to the new problems that come with today's rapidly changing industries.

We value your input on course content enhancements. Please feel free to contact our development team at 1-800-777-0753 to submit any course or material improvement suggestions.

References

We have provided a limited client list for your reference. You will find many of our customers are among the prestigious ranks of the Fortune 500. We do not list our customers' contact information for privacy and security reasons. If you need additional information or references, please contact us and we will be happy to accommodate you.

Ford Motor Company

General Motors Corporation

Delphi Automotive

DaimlerChrysler

Visteon Automotive

Pratt & Whitney

Eastman Kodak

Carrier Corporation

International Paper

Georgia Pacific

Procter & Gamble

State Farm Insurance

Lucent Technologies

American Electric Power

Willamette Industries

Weyerhauser

Allison Transmission

Anheuser-Busch

Johnson Control

Alcoa

Boise Cascade

Rubbermaid

ZF Batavia

- **Introduction to Ladder Logic**

- **Maintenance & Troubleshooting of the Allen-Bradley PLC-2**

- **Maintenance & Troubleshooting of the Allen-Bradley PLC-3**

- **Maintenance & Troubleshooting of the Allen-Bradley PLC-5**

- **Maintenance & Troubleshooting of the Allen-Bradley SLC500**

- **Allen-Bradley PanelView Systems 550, 900, 1200 & 1400**

- **DeviceNet**

- **Allen-Bradley ControlNet**

- **Allen-Bradley ControlLogix & RSLogix5000**

- **Software Selection Chart**

- **Software Training**

Introduction to Ladder Logic

Category C	**Course Number PL 101**

Course Description This is a sixteen-hour course designed for the beginner or apprentice interested in learning the very basics of the Allen Bradley PLC control. Much of the emphasis is placed on PLC components, terminology, and examples of basic ladder logic and proper formats.

Who Should Attend Apprentice electricians and other technical personnel eventually becoming involved with the installation, operation, troubleshooting or programming of the Allen Bradley family of PLC controls, or, anyone wanting a general overview of Allen Bradley PLC's.

Prerequisites Because this is a beginner's course, only a general desire to learn the Allen Bradley PLC control and its capabilities is required.

Length 16 hours
Class Size Up to 10
CEU Awarded 1.4

Coures Format Hands-on Workshop. One lab station for every two participants.

Software Format Clients can choose from the following:
- **RSLogix 5** Windows based software on personal computers
- **Allen Bradley 6200** series software on personal computers
- **ICOM AI** series software on personal computers.

Learning Objectives **Participants will learn to:**

- Become acquainted with the Allen Bradley hardware

- Learn the various numbering systems and their applications

- Allen Bradley Numbering scheme

- Review the differences between 8, 16 & 32 point modules

- Review the memory layout

- Lower level instructions

- Creating a Ladder Logic program

- Troubleshooting concepts

- Configure DIP switch settings on components

- Altering and saving ladder logic programs

Course Customization **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Maintenance & Troubleshooting of Allen-Bradley PLC-2 Level One

Category C   **Course Number PL 221**

Course Description   This thirty-six hour, hands-on course is designed to present an introduction of the Allen Bradley PLC-2 family controls to the participant. Component hardware and troubleshooting techniques are the emphasis of this course.

Who Should Attend   Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the PLC-2 family of controls.

Prerequisites   Familiarity with relay logic, hands-on experience or completion of the *Introduction to Ladder Logic* course # PL101.

Length   36 hours
Class Size   Up to 10
CEU Awarded   3.15

Course Format   Hands-on Workshop. One lab station for every two participants.

Software Format   Clients can choose from the following:
- **T-3** Industrial terminals
- **Allen Bradley 6200** series software on personal computers
- **ICOM AI** series software on personal computers.

Learning Objectives **Participants will learn to:**

- Become acquainted with the Allen Bradley format of addressing

- Locate and identify catalog numbers for components

- Navigate through the ladder logic

- Setup the data table to configure a system

- Select the correct DIP switch settings to configure components

- Install and correctly and safely dispose of PLC batteries

- Make back-up copies of programs

- Select and program lower lever instructions

- Troubleshoot corrupt ladder logic programs

- Identify and use 'Last Man Wins' program format

Course Customization **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

Programmable Logic Controls

Maintenance & Troubleshooting of the Allen-Bradley PLC-2 Level Two

Category C   **Course Number PL 321**

Course Description   This thirty-six hour hands-on course is designed to introduce the participant to the ***advanced level*** of the Allen Bradley PLC-2 family control. The upper level instructions and advanced troubleshooting techniques are the emphasis of this course.

Who Should Attend   Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the PLC-2 family of controls.

Prerequisites   The participant must be familiar with relay logic, hands-on experience or completion of the *PLC-2 Level 1* course # PL221.

Length   36 hours
Class Size   Up to 10
CEU Awarded   3.15

Course Format   Hands-on Workshop. One lab station for every two participants.

Software Format   Clients can choose from the following:
- **T-3** Industrial terminals
- **Allen Bradley 6200** series software on personal computers
- **ICOM AI** series software on personal computers.

Learning Objectives   **Participants will learn:**

- Data Highway overview

- Communication Paths

- Set-up a cross-reference table

- Use a histogram to troubleshoot

- Block transfer

- Remote I/O concepts

- Communicating with peripheral devices

- Select and program upper lever instructions

- Troubleshoot customers corrupt ladder logic programs

- Online editing

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Maintenance & Troubleshooting of the Allen-Bradley PLC-3 Level One

Category C   **Course Number PL 231**

Course Description   This is an entry level, thirty-six hour, hands-on course. It is designed to present, to the participant, the lower level instruction set and the basic issues surrounding the Allen Bradley PLC-3 family of controls.   Additionally, the PLC-3 hardware, Allen Bradley 6200 software (or the T-4 industrial terminal) and introductory concepts of communications are covered.

Who Should Attend   Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the PLC-3 family of controls.

Prerequisites   Participants are urged to have a working knowledge of relay logic, hands-on experience or completion of the Introduction to *PLC's & Ladder Logic* course.

Length   36 hours
Class Size   Up to 8
CEU Awarded   3.15

Course Format   Instructor led, hands-on workshop using one PLC-3 or PLC-3/10 lab station for every two participants.

Software Format   Clients can choose from the following software on personal computers:
- **T-4 Industrial Terminal**
- **Allen Bradley 6200** series software
- **ICOM AI** series software

Learning Objectives   **Participants will learn:**

- Introduction of the PLC-3 and PLC-3/10 family of hardware

- Numbering systems

- Lower level instructions

- Storing and retrieving a ladder logic program

- Navigating through the ladder logic

- Pointers

- Compiling a simple ladder logic program

- Subroutines

- Data Highway and Remote I/O concepts

- Troubleshooting clients' ladder logic issues

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Maintenance & Troubleshooting of the Allen-Bradley PLC-3 Level Two

Category C   **Course Number PL 331**

Course Description   This is an advanced and nearly mandatory second level, thirty-six hour, hands-on course. It is designed to present, to the participant, the upper level instruction set and the complex issues surrounding the Allen Bradley PLC-3 and PLC-3/10 family of controls.   Additionally, the multifaceted capabilities and massive I/O structures are covered as well as communications between the various other Allen Bradley components.

Who Should Attend   Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the PLC-3 family of controls.

Prerequisites   Participants are urged to have a working knowledge of PLC logic, hands-on experience or completion of the Introduction to *Maintenance and Troubleshooting Allen Bradley PLC-3 Level One* course.

Length   36 hours
Class Size   Up to 8
CEU Awarded   3.15

Course Format   Instructor led, hands-on workshop using one PLC-3 or PLC-3/10 lab station for every two participants.

Software Format   Clients can choose from the following software on personal computers:
- **T-4 Industrial Terminal**
- **Allen Bradley 6200** series software
- **ICOM AI** series software

Learning Objectives   **Participants will learn:**

- Memory structure Organization

- Advanced Data Highway and Remote I/O concepts

- Upper level instructions

- Block transfer

- Sequencing

- Data Manipulation

- Dissecting a complex ladder logic program

- Advanced Subroutine concepts

- Analog and PID considerations

- Troubleshooting clients' ladder logic issues

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Maintenance & Troubleshooting of the Allen-Bradley PLC-5 Level One

Category C   **Course Number PL 251**

Course Description   This is an entry level, thirty-six hour, hands-on course. It is designed to present, to the participant, the lower level instruction set and the basic issues surrounding the Allen Bradley PLC-5 family of controls.   Additionally, the PLC-5 hardware, RSLogix-5 software and introductory concepts of communications are covered.

Who Should Attend   Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the PLC-5 family of controls.

Prerequisites   Participants are urged to have a working knowledge of relay logic, hands-on experience or completion of the Introduction to *PLC's & Ladder Logic* course.

Length   36 hours
Class Size   Up to 10
CEU Awarded   3.15
College Transfer Credit   2 credit hours recommended

Course Format   Instructor led, hands-on workshop using one PLC-5 lab station for every two participants.

Software Format   Clients can choose from the following software on personal computers:
- **RSLogix 5** series software
- **Allen Bradley 6200** series software
- **ICOM AI** series software

Learning Objectives   **Participants will learn:**

- Introduction of the PLC-5 family of hardware

- Numbering systems

- Windows review

- Lower level instructions

- Storing and retrieving a ladder logic program

- Navigating through the ladder logic

- Compiling a simple ladder logic program

- Subroutines

- Data Highway and Remote I/O concepts

- Troubleshooting clients' ladder logic issues

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Maintenance & Troubleshooting of the Allen-Bradley PLC-5 Level Two

Category C   **Course Number PL 351**

Course Description   This is an advanced level, thirty-six hour, hands-on course. It is designed to present, to the participant, the upper level instruction set and the complex issues surrounding the Allen Bradley PLC-5 family of controls including communication protocols. Troubleshooting techniques, ancillary components like the PanelView MMI, Flex I/O and communications are the emphasis of this course.

Who Should Attend   Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the PLC-5 family of controls.

Prerequisites   Participants are urged to have a working knowledge of PLC logic, hands-on experience or completion of the Maintenance and Troubleshooting Allen Bradley PLC-5 Level One course.

Length   36 hours
Class Size   Up to 10
CEU Awarded   3.15

Course Format   Instructor led, hands-on workshop using one PLC-5 lab station for every two participants.

Software Format   Clients can choose from the following software on personal computers:
- **RSLogix 5** series software
- **Allen Bradley 6200** series software
- **ICOM AI** series software

Learning Objectives   **Participants will learn:**

- Review the PLC-5 family of hardware

- Data highway plus

- RSLogix 5 upper level instructions

- Accessing program files

- Online editing

- Program documentation

- Arrays

- Block transfer

- Trending

- Troubleshooting clients' ladder logic issues

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Maintenance & Troubleshooting of the Allen-Bradley SLC500 Level One AE

Category C   **Course No. PL 256**

Course Description   This is an entry level, thirty-six hour, hands-on course. It is designed to present, to the participant, the lower level instruction set and the basic issues surrounding the Allen Bradley SLC-500 family of controls.   Additionally, the SLC-500 hardware, RSLogix-500 software and introductory concepts of communications are covered.

Who Should Attend   Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the SLC-500 family of controls.

Prerequisites   Participants are urged to have a working knowledge of relay logic, hands-on experience or completion of the Introduction to *PLC's & Ladder Logic* course.

Length   36 hours
Class Size   Up to 10
CEU Awarded   3.15
College Transfer Credit 2 credit hours recommended

Course Format   Instructor led, hands-on workshop using one SLC-500 lab station for every two participants.

Software Format   Clients can choose from the following software on personal computers:
- **RSLogix 500** series software
- **Allen Bradley APS** series software
- **ICOM AI** series software

Learning Objectives   **Participants will learn:**

- Introduction of the SLC-500 family of hardware

- Numbering systems

- Windows review

- Lower level instructions

- Storing and retrieving a ladder logic program

- Navigating through the ladder logic

- Compiling a simple ladder logic program

- Subroutines

- Data Highway and Remote I/O concepts

- Troubleshooting clients' ladder logic issues

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Maintenance & Troubleshooting of the Allen-Bradley SLC500 Level Two

Category C **Course Number PL 356**

Course Description This is an advanced level, thirty-six hour, hands-on course. It is designed to present, to the participant, the upper level instruction set and the complex issues surrounding the Allen Bradley SLC-500 family of controls including communication protocols. Troubleshooting techniques, ancillary components like the PanelView MMI, Flex I/O and communications are the emphasis of this course.

Who Should Attend Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the SLC-500 family of controls.

Prerequisites Participants are urged to have a working knowledge of PLC logic, hands-on experience or completion of the Maintenance and Troubleshooting Allen Bradley SLC-500 Level One course.

Length 36 hours
Class Size Up to 10
CEU Awarded 3.15

Course Format Instructor led, hands-on workshop using one SLC-500 lab station for every two participants.

Software Format Clients can choose from the following software on personal computers:
- **RSLogix 500** series software
- **Allen Bradley APS** series software
- **ICOM AI** series software

Learning Objectives **Participants will learn**:

- Review the SLC-500 family of hardware

- Data highway plus

- RSLogix 500 upper level instructions

- Accessing program files

- Online editing

- Program documentation

- Arrays

- Block transfer

- Trending

- Troubleshooting clients' ladder logic issues

Course Customization **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Allen-Bradley PanelView Systems 550, 600, 1200, & 1400

Category C

Course Number PL 361

Course Description

This is an intermediate level, thirty-two hour, hands-on course. It is designed to present, to the participant, the basic requirements to setup, communicate and troubleshoot the Allen Bradley PanelViews.

Who Should Attend

Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the Allen Bradley family of PanelViews.

Prerequisites

Participants are urged to have a working knowledge of the Allen Bradley PLC-5 or SLC-500 family of controls, hands-on experience or completion of the *Introduction to Maintenance & Troubleshooting of the Allen Bradley PLC-5 Level One or Maintenance & Troubleshooting of the Allen Bradley SLC-500 Level One* course.

Length   32 hours
Class Size   Up to 10
CEU Awarded   2.8

Course Format

Instructor led, hands-on workshop using one PLC-5 lab station for every two participants. The PanelView selected for this course will match that of the clients. PanelView choices: 550, 900, 1000, 1200 or 1400e.

Software Format

Applicable **PanelBuilder** software will accompany this course while using RSLogix 5 or 500.

Learning Objectives

Participants will learn:

- Understanding the PLC and PanelBuilder software & hardware

- Addressing PLC I/O

- Observing simple ladder logic operation

- Identifying Data Tables

- Adding objects to the PanelView screen

- Transferring a project to the PanelView screen

- Utilizing the PanelView I/O from the PLC ladder logic

- Navigating between the PanelView screens

- Setting up PLC controlled screens

- Configuring Alarm and Information screens

- Block Transfers to and from a PanelView

Course Customization

Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

DeviceNet

Category C	**Course Number PL 371**

Course Description   This is an intermediate level, thirty-six hour, hands-on course. It is designed to present, to the participant, the entire DeviceNet instruction set and the basic issues surrounding the Allen Bradley PLC-5 DeviceNet family of controls.   Additionally, the PLC-5 & SLC-500 hardware, Flex I/O, RSLogix-5 software and DeviceNet (SDN) series of communications are covered. (Ethernet will be covered if time permits)

Who Should Attend   Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the PLC-5 and SLC-500 DeviceNet (SDN) Series of controls.

Prerequisites   Participants are urged to have a working knowledge of PLC logic, hands-on experience or completion of the *Introduction to Maintenance & Troubleshooting the Allen Bradley PLC-5* course # PL 251.

Length   36 hours
Class Size   Up to 10
CEU Awarded   3.15

Course Format   Instructor led, hands-on workshop using one PLC-5, SLC-500 and DeviceNet Series lab station for every two participants.

Software Format   Clients will use the following software on personal computers:
- **RSLogix 5** series software
- **RSLinx** communication software

Learning Objectives   **Participants will learn:**

- Recognizing the hardware

- Configuring RSLinx communication server

- Windows review

- Using RSNetworx for DeviceNet

- Navigating RSLogix to locate information from the DeviceNet

- Understanding PLC Data Tables

- Configuring the DeviceNet network

- Mapping data into the PLC memory

- Utilizing DeviceNet information in the PLC program

- Troubleshooting the clients DeviceNet system

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Allen-Bradley ControlNet

Category C	**Course Number PL 376**

Course Description

This is an intermediate level, thirty-six hour, hands-on course. It is designed to present, to the participant, the entire ControlNet instruction set and the basic issues surrounding the Allen Bradley PLC-5 ControlNet family of controls. Additionally, the PLC-5 hardware, RSLogix-5 software and ControlNet series 1.5 concepts of communications are covered.

Who Should Attend

Maintenance electricians and other technical personnel involved with the installation, operation, troubleshooting or programming of the PLC-5 ControlNet Series 1.5 family of controls.

Prerequisites

Participants are urged to have a working knowledge of PLC logic, hands-on experience or completion of the Introduction to *Maintenance & Troubleshooting the Allen Bradley PLC-5* course # PL 251.

Length   36 hours
Class Size   Up to 10
CEU Awarded   3.15

Course Format

Instructor led, hands-on workshop using one PLC-5 ControlNet Series 1.5 lab station for every two participants.

Software Format

Clients will use the following software on personal computers:
- **RSLogix 5** series software
- **RSLinx** communication software

Learning Objectives

Participants will learn:

- Recognizing the hardware

- Configuring RSLinx

- Windows review

- Using RSNetworx for ControlNet 1.5

- Navigating RSLogix to locate information from the ControlNet

- Understanding PLC Data Tables

- Configuring the ControlNet network

- Mapping data into the PLC memory

- Utilizing ControlNet information in the PLC program

- Troubleshooting the clients ControlNet system

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Allen-Bradley ControlLogix & RSLogix5000

Category C   **Course Number PL 481**

Course Description   This is Allen Bradley's newest and most complex family of processors and hardware, which utilize RSLogix 5000 software. This design can incorporate a variety of communication protocols including: Ethernet, Data Highway, Remote I/O, ControlNet and DeviceNet. We strongly recommend that clients customize this course.

Who Should Attend   Maintenance electricians and other technical personnel involved with the design, installation, operation, troubleshooting or programming of the ControlLogix family of controls.

Prerequisites   It is recommended that the participant be familiar with the Allen Bradley PLC-5 or SLC-500 family of controllers and some amount of hands-on time with troubleshooting PLC controls. Additionally, participants are strongly urged to have a comfortable working knowledge of Windows.

Length   36 hours
Class Size   Up to 10
CEU Awarded   3.15

Course Format   Instructor led, hands-on workshop using one ControlLogix lab station for every two participants.

Software Format   **RSLogix 5000** Windows based software on personal computers

Learning Objectives   **Participants will learn to:**

- Identify the ControlLogix Hardware

- Use the RSLinx communication system

- Transfer PLC-5 & SLC-500 ladder logic projects to RSLogix 5000 format

- Identify the addressing scheme for RSLogix 5000

- Navigate through the Windows based ladder logic

- Accessing data tables

- Accessing program files

- Properly use lower level instructions

- Setup proper program documentation

- Prepare alias tag names

- Develop custom data monitoring for future reference and troubleshooting

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmable Logic Controls

Course Software Selection Chart

The reference chart shown below illustrates applicable PLC related software that can be utilized in our PLC courses

	Rockwell Software	Allen-Bradley	ICOM	Taylor
	Windows Based	DOS Based	DOS Based	DOS Based
PLC-2		✓	✓	✓
PLC-3		✓	✓	
PLC-5		✓	✓	✓
SLC-500	✓	✓	✓	✓
MicroLogix	✓			
PanelView	✓			
ControlLogix	✓			

Software Training

The following courses are led by a Microsoft® Certified Trainer and follow the Microsoft® Official Curriculum.

Recommended SQL 7.0 Course Titles:
- System Administration for Microsoft® SQL Server 7.0
- Implementing a Database on Microsoft® SQL Server 7.0

Recommended SQL 2000 Titles:
- Querying Microsoft® SQL Server 2000 with Transact-SQL
- Administering a Microsoft® SQL Server 2000 Database
- Programming a Microsoft® SQL Server 2000 Database

Recommended Visual Basic Titles:
- Mastering Microsoft® Visual Basic 6 Fundamentals
- Mastering Microsoft® Visual Basic 6 Development
- Mastering Enterprise Development Using Microsoft® Visual Basic
- Mastering Web Application Development Using Microsoft® Visual InterDev 6

Recommended 2000 Network Class Titles:
- Microsoft® Windows 2000 Network and Operating System Essentials
- Implementing Microsoft® Windows 2000 Professional and Server
- Implementing a Microsoft® Windows 2000 Network Infrastructure
- Implementing and Administering Microsoft® Windows 2000 Directory Services
- Deploying and Managing Microsoft® Internet Security and Acceleration Server 2000
- Designing a Microsoft® Windows 2000 Directory Services Infrastructure
- Designing a Microsoft® Windows 2000 Migration Strategy

Programmable Logic Controls

**Call 1-800-777-0753 for a detailed outline in these course offerings,
or simply visit us on the web at www.hanetraining.com**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.
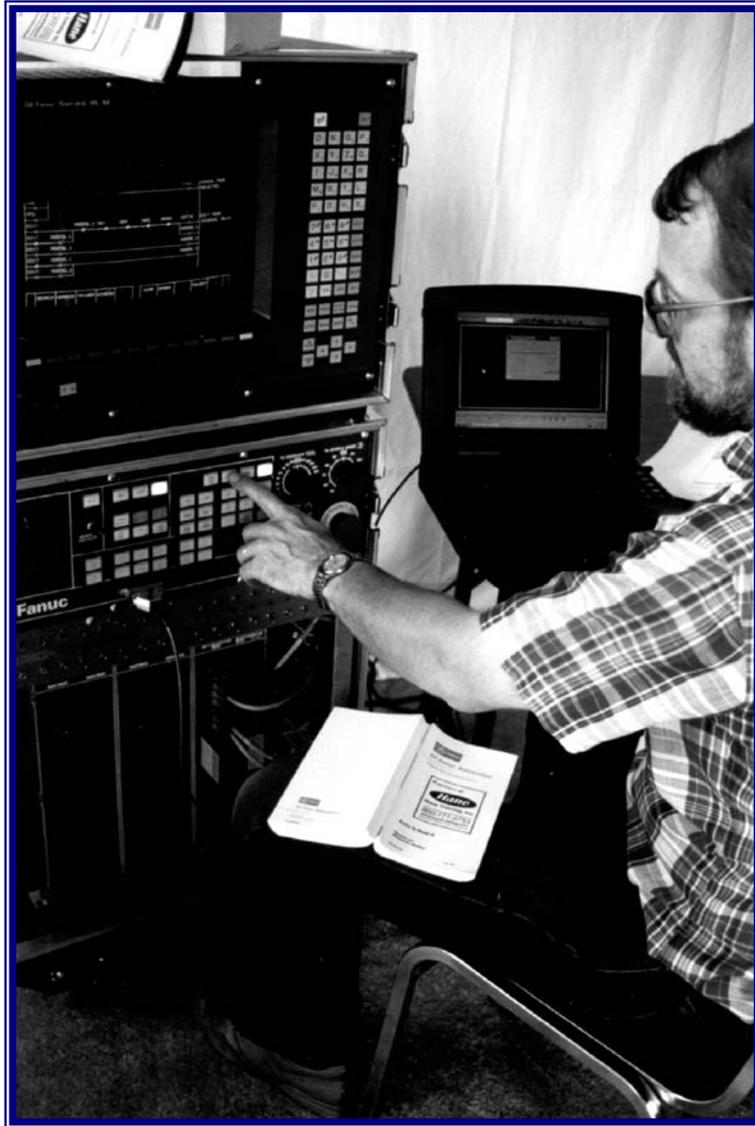
- **Introduction to CNC**

- **Operator Training for the GE-Fanuc Series 15 CNC**

- **Programmer Training for the GE-Fanuc Series 15 CNC**

- **Advanced Programmer Training for the GE-Fanuc 15 CNC**

- **Maintenance & Troubleshooting with the GE-Fanuc Series 15 CNC**

- **Maintenance & Troubleshooting with the GE-Fanuc Series 16/18 CNC**

- **Advanced Maintenance & Troubleshooting of the GE-Fanuc Series 15 CNC**

- **Maintenance & Troubleshooting of the Allen-Bradley 7300/8200 CNC**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Introduction to CNC

Category C	**Course Number NC 101**

Course Description   The purpose of this twenty-four hour course is to provide the electrician with information and basic troubleshooting skills pertaining to the general maintenance of Computerized Numerical Controls (CNC). To reinforce the learning experience, participants will apply the skills they learned in the class through active participation with an actual CNC control. Discussions regarding specific applications will also strengthen the participants' learning skills.

Who Should Attend   Electricians, electronic technicians or others who must troubleshoot CNC systems.

Prerequisites   None

Length   24 hours
Class Size   Up to 10
CEU Awarded   2.1

Format   Intensive Hands-on Workshop.

Learning Objectives   **Participants will learn to:**

- Assemble the major components of a CNC System

- Diagnose a CNC unit with known corrupt modules

- Develop a plan, based on classroom techniques, to repair a damaged CNC unit

- Utilize diagnostic equipment to isolate errors

- Prioritize failure modes

- Troubleshoot a CNC unit from the diagnostic routine software

- Configure replacement modules

- Practice proper installation techniques for damaged modules

- Review parts program formats

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

Computer Numerical Controls

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Category B	Course Number NC 111

Course Description This forty hour, hands-on course targets skilled trades personnel who are involved in CNC operation. Participants will learn how to use automatic and manual mode operations as well as read parts programs and use code system commands.

Who Should Attend All skilled tradesmen whose responsibilities include the operation of the GE-Fanuc Series 15 CNC.

Prerequisites None

Length 40 hours
Class Size Up to 8
CEU Awarded 3.5
College Transfer Credit 2 credit hours recommended

Format Hands-on Workshop. One lab station for every two participants.

Learning Objectives **Participants will learn to:**

- Select and use the automatic modes of operation such as EDIT, MEM, MDI and TAPE

- Select and use the manual modes of operation such as JOG, INC and HND

- Run a parts program

- Use single block, dry run and other functional CNC procedures

- Demonstrate an understanding of the overall CNC environment

Course Customization **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

Computer Numerical Controls

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Programmer Training for the GE-Fanuc Series 15 CNC

AcE

Category B   **Course Number NC 121**

Course Description   This forty hour, hands-on course covers effective troubleshooting of parts programs and identification of specific parameters that deal with parts programming of the CNC machine.

Who Should Attend   All skilled tradesmen, maintenance or engineering personnel whose responsibilities include the maintenance and repair of the GE-Fanuc Series 15 CNC.

Prerequisites   None

Length   40 hours
Class Size   Up to 8
CEU Awarded   3.5
College Transfer Credits   2 credit hours recommended

Format   Hands-on Workshop. One lab station for every two participants.

Learning Objectives   **Participants will learn to:**

- Demonstrate an understanding of practical functions and programs

- Use the GE-Fanuc Series 15 CNC including:

  - CRT and Keyboard

  - Data Management

  - Parts Programming

  - Basic Troubleshooting Skills

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

Computer Numerical Controls

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Advanced Programmer Training for the GE-Fanuc Series 15 CNC

AE

Category B   **Course Number NC 221**

Course Description   This forty hour, hands-on course covers advanced techniques for creating, maintaining and troubleshooting parts, programs and parameters that deal with parts programming for the CNC machine.

Who Should Attend   All skilled trades personnel, operators, programmers, maintenance and engineering personnel whose responsibilities include parts programming, maintenance or engineering of the GE-Fanuc control who need knowledge of higher level G code or macro formatted programs.

Prerequisites   Two years of CNC operation or the equivalent. One year of programming or completion of the Hane workshop *Programmer Training for the GE-Fanuc Series 15 CNC (NC 121).*

Length   40 hours
Class Size   Up to 8
CEU Awarded   3.5
College Transfer Credit   2 credit hours recommended

Format   Hands-on Workshop. One lab station for every two participants.

Learning Objectives   **Participants will learn to:**

- Recognize CNC hardware components and programmer controllable inputs

- Create G codes and M codes

- Create programs in G code format and macro format

- Do math for machine positioning

- Create and use tool offset information

- Set tool and work offset information directly from a part program

- Set up and use canned cycles; create their own canned cycles

- Use and recognize different G code lists

- Edit new and existing programs

- Recognize "ladder to program" or "program to ladder" inputs and outputs

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

Computer Numerical Controls

Computer Numerical Controls

Category B	**Course Number NC 231**

Course Description   This forty hour, hands-on course is practical and down-to-earth training for the GE-Fanuc Series 15 CNC machine. The ladder or sequence program operation is explained in this course and editing of the ladder program is done to further enhance the understanding of the signaling process.

Who Should Attend   Maintenance personnel including electricians, technicians, machine repairmen, supervisors or plant engineers who need a basic maintenance course on the GE-Fanuc Series 15 CNC.

Prerequisites   Participants should have a good electrical background.

Length   40 hours
Class Size   Up to 8
CEU Awarded   3.5
College Transfer Credit   2 credit hours recommended

Format   Hands-on Workshop. One lab station for every two participants.

Learning Objectives   **Participants will learn to:**

- Identify nomenclatures, descriptions and functional relationships of the printed circuit boards

- Use the manual data input keyboard for data input and use the "softkeys" for main and sub-menu manipulation

- Use signal list and signal detail list to identify, locate and trace Basic Machine Interface (BMI) signals from external sources into the programmable machine controller through the sequence program and into the computer numerical control, internal relays or external outputs

- Sequence program construction and symbols used within the program

- Selection and setting of machine parameters

- Use the following for troubleshooting:

  - Image Tables
  - Trace Function
  - Cross Reference
  - Symbol Tables
  - I/O Module Tables
  - Signal Flow
  - LED's
  - Alarm Messages

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Maintenance &Troubleshooting with the GE-Fanuc Series 16/18 CNC

Category B   **Course Number NC 231**

Course Description   This forty hour, hands-on course is practical and down-to-earth training for the GE-Fanuc Series 16/18 CNC machine. The ladder or sequence program operation is explained in this course and editing of the ladder program is done to further enhance the understanding of the signaling process.

Who Should Attend   Maintenance personnel including electricians, technicians, machine repairmen, supervisors or plant engineers who need a basic maintenance course on the GE-Fanuc Series 16/18 CNC.

Prerequisites   Participants should have a good electrical background.

Length   40 hours
Class Size   Up to 8
CEU Awarded   3.5

Format   Hands-on Workshop. One lab station for every two participants.

Learning Objectives   **Participants will learn to:**

- Identify nomenclatures, descriptions and functional relationships of the control unit module

- Use the panel keyboard for manual data input and use the "softkeys" for main and sub-menu manipulation

- Use signal list and signal detail list to identify, locate and trace Basic Machine Interface (BMI) signals from external sources into the programmable machine controller (PMC) through the sequence program and into the computer numerical control, internal relays or external outputs

- Construct a sequence program and understand the symbols used within the program

- Selection and setting of machine parameters

- Use the following for troubleshooting:

  - Image Tables
  - Trace Function
  - Cross Reference
  - Symbol Tables
  - I/O Module Tables
  - Signal Flow
  - Analyzer & Scope Screens
  - Alarm Messages

- Upload and download part programs and parameters using a PC and PCMCIA cards

Course Customization   **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

To Schedule please call 1-800-777-0753. Ask for your Client Representative.

Computer Numerical Controls

Advanced Maintenance & Troubleshooting of the GE-Fanuc Series 15 CNC

AE

Category B	**Course Number NC 331**

Course Description This in-depth program covers forty hours of restart methodology, circuit flow analysis, editing functions, communications and parts programs from the standpoint of the advanced troubleshooter.

Who Should Attend Maintenance personnel including electricians, technicians, machine repairmen and any supervisors or plant engineers who want a practical down-to-earth course on advanced maintenance and troubleshooting of GE-Fanuc Series15 CNC.

Prerequisites Completion of Hane's forty-hour course, *Maintenance & Troubleshooting with the GE-Fanuc Series 15 CNC (NC 231)* or equivalent knowledge as evidenced by successfully passing Hane's written CNC test.

Length 40 hours
Class Size Up to 8
CEU Awarded 3.5
College Transfer Credit 2 credit hours recommended

Format Hands-on Workshop. One lab station for every two participants.

Learning Objectives **Participants will learn to:**

- Restart by using the short method

- Format data (binary, hexadecimal, ASCII)

- Analyze circuit flow

- Use the trace feature

- Recognize danger areas when working with memory

- Access the ladder and other key functions

- Upload and download parts programs

- Setup communications between a PC and the CNC

Course Customization **Call 1-800-777-0753 for a detailed outline or for information about tailoring this course to your specific needs.**

Computer Numerical Controls

To Schedule please call 1-800-777-0753. Ask for your Client Representative.