

CERTIFICATE IN

INSTRUMENTATION, AUTOMATION AND PROCESS CONTROL

12 MODULES OVER 3 MONTHS

For upcoming commencement dates, please view our course schedule at:
<http://www.eit.edu.au/schedule>



WHAT YOU WILL LEARN:

- Instrumentation terms, concepts, diagrams and symbols
- Implement an instrument and wiring number system
- Overview of the use of PLCs in industrial applications
- Pressure sources and the basic terms of pressure measurement
- Level measurement and the basics associated with it
- Temperature measurement and the various associated transducers
- Flow measurement techniques
- Control valve principles and common valve types
- New technologies such as smart instrumentation and fieldbus
- Integrate a complete system (considering instrumentation and total errors) as well as selection criteria, commissioning and testing
- Overview of HMI, SCADA and DCS systems
- Different tuning rules
- Latest ISO requirements for a company
- Overview of HAZOP studies
- Understand reliability centred maintenance and spare parts analysis
- Gain appreciation for factory and site acceptance testing
- Considerations for building in-house panels and installations

Presented by

**Dr. Rodney
Jacobs**

NH Dip, M Dip Tech, BA (Hons),
D Tech



ENROL NOW: Fax the enrolment form to us,
or email enquiries@eit.edu.au

BENEFITS OF LIVE E-LEARNING

- Attend lessons in an online classroom with your instructor and fellow students
- Upgrade your skills and refresh your knowledge without having to take valuable time away from work
- Receive information and materials in small, easy to digest sections
- Learn while you travel - all you need is an Internet connection
- Have constant support from your course instructor and coordinator for the duration of the course
- Interact and network with participants from around the globe and gain valuable insight into international practice
- Learn from international industry experts, based around the globe
- Live interactive webinars, not just a 'book on the web'
- Receive a certificate of completion for CPD purposes

PRESENTATION FORMAT

The certificate program features real-world applications and use a multi-pronged approach involving self-study, interactive on-line webinars and homework assignments with a mentor on call. The course consists of 12 modules, over a period of 3 months.

Some modules may involve a practical component or group activity. For each module there will be an initial reading assignment along with coursework or problems to be handed in and practical exercises in some cases. Participants will have ongoing support from their instructor and course coordinator.

Course reading material will be delivered in electronic (PDF) format in advance of on-line presentations. Presentations and group discussions will be conducted using a live interactive software system. Assignments will be submitted electronically and wherever possible, practical exercises will be conducted using simulation software and remote labs.

LIVE WEBINARS

During the program you will participate in 6 live interactive sessions with the instructor and other participants from around the world. Each webinar will last approximately 60 to 90 minutes, and we take student availability into consideration wherever possible before schedule webinar times. Contact us for details of webinar session scheduling. All you need to participate is an adequate Internet connection, speakers and a microphone. The software package and setup details will be sent to you prior to the course.

PRESENTED BY

DR. RODNEY JACOBS

NH Dip, M Dip Tech, BA (Hons), D Tech



Rodney has over 20 years experience in the gold mining industry, both underground, as well as specialising in Metallurgical operations in the Gold Plants. He has worked predominately in the instrumentation, process control and automation field, and is responsible for hardware and software designs associated with instrumentation. Areas of special interest include PLCs, SCADA systems, process control and programming.

Having spent many years on the shop-floor, Rodney has built up a vast amount of hands-on practical experience. Rodney is currently active as a Consulting Engineer in the field of instrumentation, both to the mining industry as well as to other general engineering companies, which require specialised solutions. He has also lectured Electronics, Electrical Engineering and Digital Systems, on a part-time basis, at university level. Rodney feels that people are the most important asset of any organisation and has a qualification in Psychology, to complement his Engineering knowledge and experience.

Rodney has presented numerous IDC training courses in the United States, England, Ireland, Scotland, Bahrain, United Arab Emirates, Iran, South Africa, Australia, New Zealand and Malaysia.

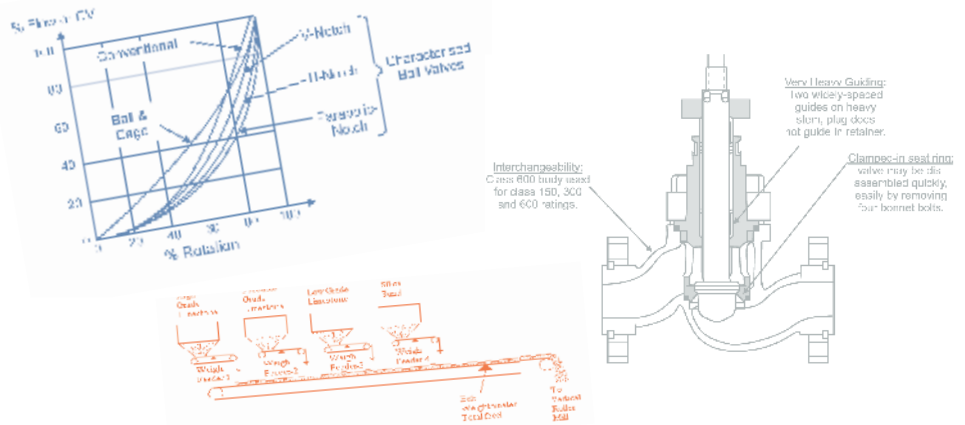
12 MODULES OVER 3 MONTHS

OVERVIEW

This course is for engineers and technicians who need to have a practical knowledge of selection, installation and commissioning of industrial instrumentation and control valves. In many respects a clear understanding and application of these principles is the most important factor in an efficient process control system.

You can only achieve excellent control of your process when your instrumentation provides the correct information. The course is for those individuals primarily involved in achieving effective results for the industrial processes they are responsible for. This would involve the design, specification and implementation of control and measurement equipment.

The course focuses on real applications, with attention to special installation considerations and application limitations when selecting or installing different measurement or control equipment.



INCLUDES 4 FREE REFERENCE MANUALS

VALUED AT OVER US\$400

YOU WILL RECEIVE 4 OF OUR UP-TO-DATE
TECHNICAL E-BOOKS TO ADD TO YOUR LIBRARY.

- Best Practice in Process, Electrical and Instrumentation Drawings and Documentation
- Practical Instrumentation for Automation and Process Control
- Practical Troubleshooting of Instrumentation, Electrical and Process Control Systems for Engineers and Technicians
- Practical Process Control

Received upon completion.

All materials required for the course will be provided electronically, in smaller, easy-to-read sections.

Please Note: e-Books are available in hard copy at 50% of the recommended retail price. Contact us for pricing details.



COURSE OUTLINE

MODULE 1: Introduction, Basic Terms and Definitions

- Basis measurement and control concepts
- Basic performance terms and conditions
- Advanced performance terms and conditions
- Definitions

MODULE 2: Diagrams and Numbering

- P & ID symbols
- Selection criteria
- Typical applications

MODULE 3: Pressure Measurement

- Principles of pressure measurement
- Pressure sources
- Mechanical transducers and elements
- Electrical transducers and elements
- Installation considerations
- Impact on the overall control loop
- Selection tables
- Future pressure technologies

MODULE 4: Level Measurement

- Principles of level measurement
- Simple sight glasses and gauging rods
- Buoyancy tape systems
- Hydrostatic pressure
- Ultrasonic measurement
- Radar measurement
- Vibration switches
- Radiation measurement
- Electrical measurement
- Density measurement
- Future level technologies

MODULE 5: Temperature Measurement

- Principles of temperature measurement
- Thermocouples
- Resistance temperature detectors (RTDs)
- Thermistors
- Liquid-in-glass, filled and bimetallic
- Non-contact pyrometers
- Humidity
- Installation considerations
- Impact on the overall control loop
- Selection tables
- Future temperature technologies

MODULE 6: Flow and Mass Measurement

- Principle of flow measurement
- Differential pressure flowmeters
- Open channel flow measurement
- Variable area flowmeters
- Oscillatory flow measurement
- Magnetic flow meters
- Positive displacement
- Ultrasonic flow measurement
- Mass flow meters
- Installation considerations
- Impact on overall control loop
- Selection tables

MODULE 7: Control Valves

- Principles of control valves
- Sliding stem valves
- Rotary valves
- Control valve selection and sizing
- Control valve characteristics / trim
- Control valve noise and cavitation
- Actuators and positioners
- Valve benchset and stroking
- Impact on overall control loop
- Selection tables
- Future technologies

MODULE 8: Basic Control Philosophies

- Open loops
- Closed loops
- Feed forward and ration control
- Feedback control
- Overview of different tuning rules available
- Cascade control
- Good practice in troubleshooting
- Adaptive and self tuning controllers

MODULE 9: Integration of the System, Modern Trends and Other Process Considerations

- Calculation of individual instruments and total error for the system
- Selection considerations
- Testing and commissioning of sub-systems
- RS 232, RS 422, RS 423, RS 485, etc.
- Fiber optic cables
- New smart instruments and fieldbus
- Noise and earthing considerations
- Materials of construction
- Linearisation

MODULE 10: Programmable Logic Controllers - Introduction to the PLC

- Digital Input / Output Systems
- Analog Input / Output Systems
- Fundamentals of PLC Programming

MODULE 11: ISO, HAZOPS, Reliability Centered Maintenance, Spare Parts Analysis, Testing and Panel Design

- ISO 9001:2000 in depth
- HAZOP analysis
- Reliability centered maintenance and spare parts analysis
- Acceptance Testing (FAT and SAT)
- Electrical design of assorted panels

MODULE 12: HMI, SCADA and DCS Systems

- System hardware and software
- Components
- Design and layout
- Alarms and reporting

HARDWARE AND SOFTWARE REQUIREMENTS

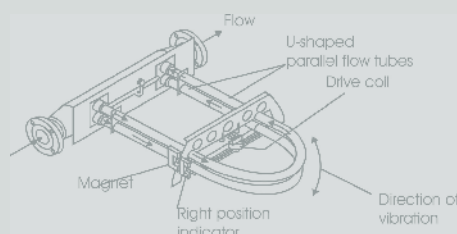
All you need to participate is an adequate Internet connection, PC, speakers and a microphone. The software package and setup details will be sent to you prior to the course.

PRACTICAL EXERCISES

Throughout the course you will participate in hands-on exercises using simulation software, which will help you put theory to practice immediately!

ENTRANCE REQUIREMENTS

Some practical work experience in some of these topics would obviously be advantageous.



CERTIFICATION

Participants completing all the assignments, and achieving 60% or more for their final mark, will receive the Engineering Institute of Technology Certificate in Instrumentation, Automation and Process Control.



ON-SITE TRAINING

We can provide our training at the venue of your choice. On-site training can be customised and by bringing the trainer to site the dates can be set to suit you!

“The Customer is Always Right” – so tell us what you need and we will design a training solution at your own site.

For a FREE detailed proposal please contact Kevin Baker via e-mail: training@idc-online.com