



# FOUNDATION™ CERTIFIED TRAINING PROGRAM

## WE TAKE TRAINING SERIOUSLY

Proper training can be the critical factor in the success of your FOUNDATION fieldbus project, and is essential for everyone involved in the lifecycle, from engineering and design to installation, startup, operations, and maintenance. The Fieldbus Foundation has developed a FOUNDATION Certified Training Program that provides an element of quality and consistency to fieldbus training. FCTP ensures that you get the maximum return on your training investment. At the Fieldbus Foundation, we take training seriously.



# FOUNDATION™ CERTIFIED TRAINING PROGRAM

STANDARDIZED PROGRAM  
ENSURES QUALITY,  
CONSISTENCY, & EXCELLENCE

## EXECUTIVE SUMMARY

FOUNDATION fieldbus has the power to transform process automation. It can greatly simplify engineering and design. It can dramatically shorten the installation and commissioning phase. It can drastically reduce maintenance costs, reduce unplanned shutdowns, and more. None of these things are possible, however, without the proper training of all those who are involved with the fieldbus project lifecycle. Today, training comes in all shapes and sizes. You can take a free introductory course from a web-based training site, you can watch YouTube videos, you can attend vendor-sponsored training, or you can go to a technical college or university.

The question is, how do you know the training you are getting is effective, follows industry and education best practices, and is held to a certain overall level of quality, both for the curriculum and the instructors? The Fieldbus Foundation decided to address these issues by forming our own FOUNDATION Certified Training Program (FCTP). Armed with a strong set of course and instructor qualifications, we have audited and certified seven training sites around the globe, with more on the way.

FCTP ensures that you are working with someone possessing a strong knowledge of FOUNDATION technology principles; a consistent understanding of fieldbus fundamentals and a proven ability to implement fieldbus-based control systems. Beginning automation students are able to identify colleges, universities and other facilities offering a certified FOUNDATION educational curriculum. After graduating, they will be able to present official FCTP certificates to

## LOOK FOR THE FCTP LOGO

All of our certified training sites display the FOUNDATION Certified Training Program logo to show they have passed our stringent qualifications for course materials and instructor excellence. Today there are seven certified training centers around the world from the USA and Canada to Europe, Asia, and Latin America, with more on the way.




**Please share your  
comments and feedback  
with us. Just email us at  
[marketing@fieldbus.org](mailto:marketing@fieldbus.org)**

potential employers. Existing automation professionals completing certified courses can expand their job skills and employment value within their companies.

### The Growing Importance of Training in Process Automation

Most people are familiar with the ongoing human resources crisis in the world of process automation. Too few workers, with more and more retiring or being downsized every day, without enough skilled new workers coming in to replace them. In many cases, new workers may not have a college degree or they have a two-year degree from a technical college. Even then, the pool of new workers is small. The US-based web site Matchcollege.com reports that of the nearly 2,000 US colleges offering Associates Degrees in 2008, less than 40 offered an instrumentation degree or certificate, with only 510 degrees awarded that year. The problem is not limited to the US or other developed economies. Developing regions like China and India are adding new manufacturing capacity so fast that they cannot find enough qualified people either.



 =Certified Training Center

 =Offering Courses, Undergoing Auditing Process

**With Seven Certified Training Centers and Two being Audited, FCTP Covers the Globe**

Fortunately, many of those entering the workforce today are familiar with digital technology and have been raised in the midst of the digital revolution. The concept of fieldbus is not as much of a shift as it was for the generations of workers that were raised in the era of analog instrumentation and its corresponding work processes and maintenance practices. Fieldbus is already prevalent in new grassroots projects around the world, and is finding its way into more and more retrofit and modernization projects as well. However, it does not matter if you are a child of the digital age or an industry veteran with 30 years of experience, fieldbus requires training that provides quality and consistency across the board, from sales people to engineers, operators, and technicians.

### The FOUNDATION Certified Training Program

To ensure this level of quality and consistency, we at the Fieldbus Foundation established a FOUNDATION Certified Training Program where we could evaluate, audit and certify educational institutions, course materials, and instructors. FCTP has a long history. Efforts to define and implement the program began in 2005, with our first certification in 2008. Today, there are seven training sites that have completed the auditing process and two additional sites that have audits in progress... Our certification courses have gone through a rigorous setup and were developed by a team of experts. They must adhere to many existing best practices and standards both for FOUNDATION fieldbus and for educational and technical training institutions in general.

Today, our list of FCTP sites includes:

- King Mongkut's Institute of Technology (KMITL) in Thailand
- Lee College in Texas
- SINOPEC Yanshan in China (Undergoing Auditing Process)
- Southern Alberta Institute of Technology (SAIT) in Canada
- STC Group – Brielle, Netherlands
- Trine University in Indiana,
- University of Miskolc in Hungary
- Waseda University in Japan
- LEAD in Brazil (Undergoing Auditing Process)

Several other sites are beginning the certification process in countries such as Mexico and India. FCTP means that your fieldbus training is taught at a certified training site, by a certified instructor, using certified curriculum. Through FCTP training sites, curriculum, and instructors are all audited to ensure they meet program requirements. Certified training centers are required to maintain multiple FOUNDATION fieldbus hosts and devices onsite in order to demonstrate competence with fieldbus technology. They must also demonstrate to auditors that their course material adheres to set instructional standards. FOUNDATION Certified Training Program participating universities are denoted by the use of our official FCTP logo.

#### Four Fit for Purpose Course Levels

There are currently four certified training course levels, each with a specific focus on the roles and responsibilities associated with FOUNDATION fieldbus. You can find a specific course to fit your needs.

**The FOUNDATION Certified Professional** certificate is geared towards engineers, designers, main instrumentation controls contractor, and startup and commissioning specialists wanting to increase their knowledge base of design, planning, and implementation of FOUNDATION systems.

**The FOUNDATION Certified Support Specialist** certificate is appropriate for sales professionals, end user management, and plant operating staff wanting to be knowledgeable enough to communicate intelligently about FOUNDATION technology.

**The FOUNDATION Certified Technical Specialist** certificate is designed for maintenance technicians, supervisors, and contract service support specialists who install, maintain, repair/replace and troubleshoot FOUNDATION systems.

**The FOUNDATION Certified Physical Layer Installer** certificate is aimed at electricians, integrators, technologists, wiremen, instrument mechanics and others who will be installing FOUNDATION fieldbus physical layer and associated components.

*“The audit itself is a threefold process that encompasses the site or educational institution, the curriculum, and the instructors themselves. All three must be certified in order to be considered an FCTP site.”*

Students must complete all the required courses outlined by the institution for a particular certificate to become certified. Not all of our FCTP partners teach all of these course levels, but many of them do. Many FCTP partners also offer other training courses outside the scope of FCTP courses.

### The FCTP Certification Process

When a site is interested in becoming part of the program, they need to approach the FOUNDATION fieldbus end user council and/or marketing committee in their specific region. The Fieldbus Foundation is fortunate to have strong end user councils and marketing committees around the world. These marketing committees and end user councils recommend new training sites to the Fieldbus Foundation for inclusion in FCTP. The Fieldbus Foundation then starts the process of talking to the candidate site about the details of the program and provides introductory materials. Once the Foundation agrees to engage fully with a potential site, we sign a formal agreement and begin the auditing process. The audit itself is really the core of the program and consists of a threefold process that includes the site or educational institution, the curriculum, and the instructors themselves. All three must be certified for a site to be considered an FCTP site. When a potential site signs up to be audited as a potential FCTP site, the Fieldbus Foundation will also come and do on-site training.

### The Auditing Process: Site, Curriculum, and Instructors

**The FCTP Site Audit** is conducted first, followed by audits of the curriculum and instructors. Potential sites are audited for adherence to a professional atmosphere. Most of our FCTP sites are colleges and universities, but we do not exclude other organizations. If it is a private organization that is seeking certification, it must be a company whose business model is based on training. For this reason, the Fieldbus Foundation typically excludes the automation vendors from being FCTP partners. Potential sites must also have at least three different registered FOUNDATION fieldbus hosts to ensure vendor neutrality. In addition to three hosts, the facility must also have sufficient variety of devices and other fieldbus equipment.

The **Instructor Audit** phase requires that instructors must be able to demonstrate their knowledge of each individual topic related to course materials taught. All certified instructors are expected to be able to teach all certified courses, even if the educational institution they work

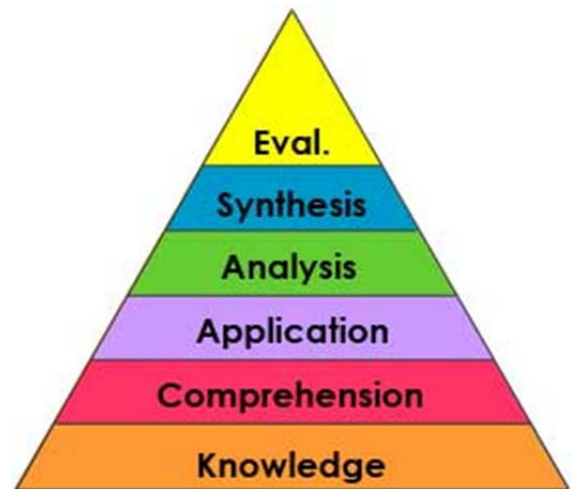


The FCTP Auditing Process

for does not teach all course levels. Instructors must all be professional technical adult educators. Instructors must also demonstrate familiarity with the various host systems installed at the FCTP site, and they need to be an official employee or at least a contractor of the educational facility or training institution that is applying for FCTP certification. Instructors are also expected to have attended FOUNDATION certified training themselves or be trained by one of our certified instructors.

The **Curriculum Audit** includes a review of all curriculum related material, from PowerPoint presentations and printed documents to handouts and lab exercises, the entire curriculum is reviewed to ensure that it adheres to the requirements of the program. The Curriculum Audit ensures consistency in coverage, but it also allows for educational institutions to retain their own style of teaching and their own uniqueness, provided the standard content is covered. Some FCTP sites, for example, may offer more hands on training with a full-scale pilot plant, while some may offer elements of remote learning combined with labs and on site lectures.

During curriculum audit, the Foundation also checks to see that the instructors are using sound methods. The Fieldbus Foundation incorporates the widely used Bloom's Taxonomy to ensure that courses cover the cognitive, affective, and psychomotor aspects required for effective training, so a certain amount of hands on interactive training and lab exercises must be provided in balance with lectures and classroom discussion. Bloom's Taxonomy is also an effective measure of how much the student is retaining through a particular educational program because it distinguishes between mere knowledge and more advanced level thinking such as analysis, synthesis, and evaluation.



**Bloom's Taxonomy**

### An Ongoing Process

Certification of an FCTP site does not end with the auditing process. FCTP is an ongoing process and instructors must submit an annual report that details their activities for the entire year. Instructors must maintain a certain number of hours of work each year. The sites themselves must also submit an annual report. FCTP members get together for an annual meeting where any additions or changes to the curriculum are reviewed, and revisions to the Fieldbus Foundation AG 181 System Engineering Guidelines are made.

### Free of Vendor Bias

Different vendor systems have unique features and interfaces and it helps to get an understanding of fieldbus that crosses vendor boundaries. That is why it makes sense to have training free of any vendor bias. FCTP ensures that your training is free of vendor bias. The audit ensures that host systems from at least three different suppliers are included in the training curriculum. Fieldbus Foundation auditors ensure that topic coverage is vendor-neutral. This gives the user the ability to make sound best in class decisions.

## FCTP PARTNER PROFILES

### King Mongkut's Institute of Technology Ladkrabang (KMITL)

King Mongkut's Institute of Technology Ladkrabang (KMITL) is one of the leading public universities in Thailand. KMITL was established in 1960 to provide education and to promote research and development in science and technology for the industrial and economic development of Thailand as well as to instill in the students a desire to serve society. With royal permission, KMITL bears the royal name of King Rama IV, known as the Father of Thai Science. KMITL also bears the royal crown emblem. Today the institute provides more than 130 multidisciplinary programs ranging from science and technology to business and management. Because of the strong support KMITL receives from leading automation manufacturers, KMITL is the first university in Thailand to offer undergraduate and graduate programs in Automation Engineering. The Fieldbus Regional Training Center operated by the Faculty of Engineering (Automation Engineering) at KMITL was founded with strong support from the Fieldbus Foundation Association of Thailand in 2009.



KMITL

#### **COURSES OFFERED**

KMITL offers the FOUNDATION Certified Support Specialist course.

#### LEAD

LEAD (Laboratory Automation and Control, Application Engineering and Development) is the result of a partnership between Petrobras and the Federal University of Rio de Janeiro (UFRJ), which aims to develop new technologies in the field of Automation and Control. LEAD has the following objectives:

- Training for projects, facilities and asset management systems to improving the use of systems of process control units for exploration, production and refining
- Identification and development of new technology

LEAD is currently being audited to be the FCTP partner site for Brazil.

#### Lee College

Lee College is one of the fastest growing community colleges in the United States, and is sixth in awarding science and technology degrees. Located at the center of the US Gulf Coast petrochemical business in Baytown, Texas, the facilities of Lee College include a multi-million dollar pilot plant and several state-of-the-art MicroPlants that allow students to build fieldbus segments, configure devices and develop control strategies. The Lee College philosophy is based on the tenet that people learn best by seeing and doing. To achieve this end, the curriculum is weighted heavily toward hands-on training in a realistic industrial environment. Lee College was one of our first FCTP partners and they train many instrument technicians for the gulf area petroleum and chemical industry.

Our chief instructor at Lee College is Chuck Carter. Chuck began his technical career with the U.S. Air Force in 1967 as an Aircraft Electronic Navigation Systems Technician. He soon became a trainer for the USAF and several foreign Air Forces, including an extended period with Brazilian military students. Afterward, he held technical positions at Bayer Corp., where he became the Process Control Systems Training Supervisor for company facilities in Baytown and Houston, TX. In 1995, Chuck left Bayer to become a full-time instructor in Instrumentation and in Process Technology at Houston's Lee College. He was a supporter of the college's efforts to build a full-scale processing facility at the college, which went on-line in 1998. In 2000, the college was awarded a National Science Foundation grant to develop maintenance education for plant-floor networking architecture and emerging technologies. Chuck was selected to serve as Director of the resulting Fieldbus Center.



Lee College

### **COURSES OFFERED**

Lee College offers the FOUNDATION Certified Professional, FOUNDATION Certified Technical Specialist, and FOUNDATION Certified Support Specialist courses.

### SAIT

Southern Alberta Institute of Technology (SAIT) Polytechnic in Calgary, Canada was one of our first FCTP partners. Established in 1916, SAIT is Canada's premier polytechnic providing relevant, skill-oriented education to 70,000 registrants annually. SAIT offers two full baccalaureate degrees, four applied degrees, 67 certificate and diploma programs, 32 apprenticeship trades and 1,600 continuing education and corporate training courses. SAIT recently upgraded its FOUNDATION fieldbus lab to incorporate FOUNDATION HSE technology. The updated laboratory demonstrates instrument interoperability from over a dozen different manufacturers. SAIT also has the capability of delivering training on-site using portable lab kits. These kits weigh less than 50 lbs. and each case contains the complete H1 network, configuration and network diagnostic tools.



**The SAIT Fieldbus Lab Provides Students with State of the Art Training**

Ed Williamson is lead instructor at SAIT. Ed has a lengthy background at Opti Canada, a developer of major petroleum projects in the Canadian oil sands region.

### **COURSES OFFERED**

SAIT offers the FOUNDATION Certified Professional and FOUNDATION Certified Technical Specialist courses.



## SINOPEC Yanshan Simulation Center

SINOPEC Yanshan Education and Training Center (YSC) is located in southwest Beijing, China. The center serves as a development and application base of simulation training technology and a training base for senior SINOPEC instrument technicians with follow-up engineering education for instrument & automation specialties. The Fieldbus Foundation Certified Training and Demonstration Center was founded by Beijing Yanshan Petrochemical Co. Ltd. and Fieldbus Foundation in 2005. The center's main features include a training classroom and demonstration facility with instruments and control devices donated by Fieldbus Foundation members. The training classroom can communicate with the demonstration facility through a FOUNDATION Fieldbus network and LAN. Training includes fieldbus technology concepts, segment design, equipment configurations, commission, segment diagnosis, and other subjects. SINOPEC Yanshan is currently undergoing the auditing process to be an FCTP partner.



SINOPEC Yanshan

## STC Group -- Brielle

Close to the Rotterdam-Europoort industrial areas, STC Group has established a unique training center for process control and automation. Process control and measurement automation training as well as dedicated FOUNDATION fieldbus training is provided at the STC Brielle training facility. FOUNDATION fieldbus training courses can be combined with elements of STC process control and automation courses. The facility also includes live processes where FOUNDATION fieldbus devices and host control systems are implemented. STC covers the training needs of the EMEA region, and has portable training and demonstration units that it can take to remote facilities for training from Western Europe all the way down to South Africa and the Middle East.

One of the key assets at STC Brielle is lead instructor Dr. Bindert Douma. Dr. Douma has an extensive process automation background at Shell Global Solutions, a leading global energy company. Dr. Douma still serves as a principal consultant for automation to Shell.



STC Group -- Brielle

## COURSES OFFERED

STC Group teaches the FOUNDATION Certified Technical Specialist course.

## Trine University

Founded in 1884, Trine University is a private, independent, co-educational institution offering associate, baccalaureate and master's degrees in more than 40 programs. It maintains a 485-acre main campus in Angola, Indiana, with off-campus centers in Fort Wayne, South Bend, Schererville,

Columbus, Logansport, and Indianapolis, Indiana. Trine University offers FOUNDATION fieldbus training that is standardized, yet tailored for the industries in the Midwest region. On-site training is available.

The chief instructor at Trine University is Dave Lancaster. Dave Lancaster is a Control Systems engineer (registered P.E. - Texas) with forty-two years of experience in the Engineering and Contractor business. He recently retired as the Chief Engineer for Control Systems for Bechtel Oil, Gas & Chemical Inc. in Houston, Texas, with thirty years of service. He has been heavily involved in FOUNDATION fieldbus technology since 1999, and taught FOUNDATION fieldbus technology internally at Bechtel. He is a senior member of ISA and has previously presented at the A&M Symposium, ISA, as well as several Fieldbus Foundation General Assemblies.



Trine University

### **COURSES OFFERED**

Trine University teaches the FOUNDATION Certified Professional course and FOUNDATION Certified Technical Specialist courses.

### University of Miskolc

The largest university in Northern Hungary, the University of Miskolc has been involved with fieldbus since 2000. In October of 2012, the University passed all the requirements to become a certified training center and will serve the entire Central and Eastern European region as the preferred FCTP partner. The University of Miskolc established a dedicated industrial communication research and training laboratory at its Research Institute of Applied Earth Sciences - Department of Research Instrumentation and Informatics. For several years, students have been able to enhance their theoretical knowledge with hands-on training and gain user experience by working on real fieldbus equipment and configurations.



University of Miskolc

Three instructors at the University of Miskolc have been certified to conduct FOUNDATION training courses. József Subert, Viktor Füvesi and Ildikó Bölkény are all members of the Research Institute of Applied Earth Sciences - Department of Research Instrumentation and Informatics and, in addition to their teaching and research roles, are key members of the program and organizing committees of the annual Distributed Control Systems (DCS) meeting, a key event in Hungary for control engineers.

### **COURSES OFFERED**

The University of Miskolc currently offers the FOUNDATION Certified Support Specialist course.

### Waseda University

Waseda is one of Japan's top private, coeducational institutions of higher learning. Founded as a college with three departments under the old Japanese system of higher education, it has grown to become a comprehensive university with two senior high schools and a School of Art and Architecture.

Waseda is currently teaching the Fieldbus Support Specialist course as an FCTP partner. Waseda is also conducting some valuable research into the application of advanced fieldbus diagnostics for both instruments and control valves as a springboard to area, unit, and plant diagnostics.

Waseda also added two new certified instructors in 2011, and will be expanding its FCTP course offerings in the near future. Dr. Yoshiharu Amano is a professor at Waseda University whose areas of research include analysis and optimization of energy systems and development of autonomous mobile systems. Yoshitsugu Morioka, has many years of experience with Yokogawa and the Fieldbus Foundation, and is currently a visiting researcher at the Waseda University Research Institute for Science and Engineering.

### **COURSES OFFERED**

Waseda University teaches the FOUNDATION Certified Support Specialist course.

### Student Registry

The Fieldbus Foundation in cooperation with our FCTP partners have created an online student registry that allows you to search for graduates of our certified courses. You can search our student registry to find graduates who have completed the FOUNDATION Certified Professional, FOUNDATION Technical Specialist, and FOUNDATION Support Specialist courses. You can get more details on our web site at <http://www.fieldbus.org>.



### THE FUTURE

Fieldbus Foundation is already in the process of working with several prospective FCTP partner sites that are expected to come online in the next couple of years. Locations for these new sites include Australia, India, Mexico, and more. The need for training in the process automation business is already great, and the significant investment that many end user companies are making in FOUNDATION fieldbus is considerable. Many of our newer applicants are the result of a significant investment in FOUNDATION technology on behalf of a single large end user in a particular region. The good news is that the new generation of workers are already familiar with digital technology and are more open to the idea of doing remote maintenance and diagnostics with intelligent devices.

### Proper Training is the Secret to Success for any Fieldbus Installation

A key part of the mission at the Fieldbus Foundation is to make sure that end users have a good experience with our technology and they realize the lifecycle benefits. You cannot have those things without good training. Training and education should be considered in the early phases of the project, should encompass all the key groups in the plant that have a stake in the project, and should incorporate the latest tools. More importantly, it should incorporate best practices, cover material in a vendor independent fashion, and be audited for consistency and quality. That is what we do at the Fieldbus Foundation, while the educational institutions themselves are free to add value and be competitive based on the level of their instructors, facilities, and variety and quality of tools on hand.

The Fieldbus Foundation merely ensures that the basic level of quality, scope, and consistency are there.

Proper training also has economic benefits that are fairly easy to prove. Better training means faster time to startup, less chance of an unexpected shutdown due to operator error, and better use of the tools that are available. In many ways, poor training is worse than no training at all. An incomplete understanding of the technology can result in mistakes during design or installation, prolonging startup. If you want to get the full lifecycle benefits of the technology, make sure your training is held to a standard. Consider the source.

FCTP Partner	Courses
King Mongkut's Institute	FOUNDATION Certified Support Specialist
Lee College Fielbus Center	FOUNDATION Certified Professional FOUNDATION Certified Technical Specialist FOUNDATION Certified Support Specialist
LEAD	Pending Certification
SAIT	FOUNDATION Certified Professional FOUNDATION Certified Technical Specialist
SINOPEC Yanshan	Pending Certification
STC Group -- Brielle	FOUNDATION Certified Technical Specialist
Trine University	FOUNDATION Certified Professional FOUNDATION Certified Technical Specialist
University of Miskolc	FOUNDATION Certified Support Specialist
Waseda University	FOUNDATION Certified Support Specialist

**FCTP Courses by Provider**

