

WORKFORCE DEVELOPMENT and TECHNICAL SKILLS CATALOG



RCBI

ROBERT C. BYRD INSTITUTE

⋮

**ADVANCING
MANUFACTURING
TECHNOLOGIES**



STAY AHEAD OF THE CURVE

...AND THE COMPETITION

To land a prime job or top contract, you have to do the job better than anyone else. You need to know more, have better skills and bring more value to the project.

IMPROVE PRODUCTIVITY

INCREASE EARNINGS

Get a competitive advantage at the Robert C. Byrd Institute for Advanced Flexible Manufacturing (RCBI) with:

- Customized Training
- Technical Skills Training
- Module-based Learning
- Online Learning
- Apprenticeship Programs
- Quality Training
- Composites Training
- Machinist/CNC Skills
- Certificate Programs
- Degree Programs

RCBI

ROBERT C. BYRD INSTITUTE

DO THE JOB BETTER.

Learn - and earn - more than the competition!

RCBI will show you how.

Financial aid available for those who qualify. Discounts available for multiple attendees from the same company.

Day, evening and weekend courses are available. Register online at RCBI.org or call 800.469.RCBI (7224).

RCBI

ROBERT C. BYRD INSTITUTE

⋮

**ADVANCING
MANUFACTURING
TECHNOLOGIES**

**WORKFORCE DEVELOPMENT
AND TECHNICAL SKILLS
CATALOG**

I. Robert C. Byrd Institute for Advanced Flexible Manufacturing (RCBI)

About Us	6
Mission	8
Facilities.	8
Equipment (Available on request and online at www.rcbi.org)	9
Accreditation and Certification	10
Vision.	10
Values	10
Equal Opportunity/Affirmative Action	10
Goals.	10
Code of Conduct.	11
Attendance	11
Dress, Hair and Jewelry	11
Alcohol and Drug	11
Cell Phone	12
Personal Conduct	12
Tardy and Absence	12
Personal Property	12
Academic Dishonesty	12
Holiday	12
Inclement Weather.	13
Responsibilities of Students	13
Strategic Partners	14
Training Options.	15
Client-site or RCBI-site customized training	15
Classroom-based training	15
In-shop training	15
Video conferencing	15
Online/Independent study programs and courses	15

II. Associate Degree, Certificate, Skill-set and Job-specific Programs

Degree-seeking Student Admission Requirements and Policies	19
Admission and Registration	19
Financial Information	19
Tuition and Fees	19
Financial Assistance and Scholarships.	19
Workforce Investment Act (WIA)	19
Veterans Upward Bound	19
Company Sponsored	19
Private Pay	19

Non-degree-seeking Student Admission Requirements and Policies . . . 20	20
Registration Deadlines	20
Readmission	20
Transfer Students	20
Transfer to Other Colleges and Institutions	20
Cancellation	20
Cancellation by RCBI	20
Attendance	21
Grading	21
Unsatisfactory Progress	21
Dismissal	21
Liability	21
Financial Information	21
Tuition and Fees	21
Course Billing	21
Multiple Attendee Discounts	21
Financial Assistance and Scholarships	22
Workforce Investment Act (WIA)	22
Veterans Upward Bound	22
Company Sponsored	22
Private Pay	22
Programs	23
Machinist Technology Program at RCBI	23
The CNC Specialist Program at RCBI	25
The Welding Technology Program at RCBI	25
Manufacturing Software Program at RCBI	26
Mechanical & Electrical Multicraft Maintenance Program at RCBI	26
Arc Welder	26
Assembler	26
Assembler: Electrical	26
CNC Operator: Lathe	27
CNC Operator: Mill	27
CNC Programmer	27
Electrician: Industrial	27
Industrial Sales	27
Inspector: Mechanical	27
Machinist/Machine Setter	28
Machinist: Tool Room	28
Maintenance and Repair: General	28
Maintenance and Repair: Industrial Machinery	28
Manufacturing Survey	28

MSSC (Manufacturing Skill Standards Council)	29
NIMS	29
Press Brake Operator	29
Press Operator	29
Production Grinder.	29
Production/Manufacturing Engineer	29
Quality/Lean Manager	30
Sales Engineer.	30

III. Technical Skills Course Descriptions

Abrasives	34
Adhesives	34
CAD/CAM Software.	35
CNC	36
Coatings	41
Composites	41
Electrical	43
Fasteners.	44
Hydraulics & Pneumatics	45
Inspection	47
Machinist Technology/CNC	48
Manual Machining	50
Materials	50
Mechanical Systems	52
Metal Cutting	53
Motor Controls.	54
PLCs	56
Press Brakes	57
Professional Development	58
Quality	63
Rigging	68
Robotics	68
Safety	69
Shop Essentials.	71
Soldering	73
Stamping.	74
Welding	75
Workholding	77

IV. Index. 79

Academic Calendar (Available on request and online at www.rcbi.org)

Staff and Trainers (Available on request and online at www.rcbi.org)



**ROBERT C. BYRD INSTITUTE
FOR ADVANCED
FLEXIBLE
MANUFACTURING**



ABOUT US

At the Robert C. Byrd Institute for Advanced Flexible Manufacturing, manufacturers are the priority today just as they were when we began meeting their needs more than 20 years ago. We continue to support, assist and champion manufacturing with the goal of transforming West Virginia into a powerful player in today's global economy.

Envisioned by West Virginia's legendary U.S. Senator Robert C. Byrd as "a unique blend of academia and industry working together," RCBI – as we're usually called – helps manufacturers and entrepreneurs keep pace with the many challenges presented by today's highly competitive economy.

In the early 1990s, RCBI began operations in Huntington's downtown business district. From this single location RCBI began addressing industry's everyday needs, leasing time on cutting edge production and prototyping equipment, while also delivering specialized training and work force development programs. RCBI has provided these services to manufacturers across West Virginia and the region. RCBI primarily serves all of West Virginia and portions of Pennsylvania, Maryland, Virginia, Kentucky and Ohio. However given RCBI's abilities, our unique blend of services has been provided in 17 states including Alabama, California, Florida, Georgia, Illinois, Michigan, Mississippi, New Hampshire, New Jersey, North Carolina and Washington.

In 1996, RCBI initiated a statewide expansion effort to ensure manufacturers and entrepreneurs would have easier access to our technical service offerings. Today RCBI operates Advanced Manufacturing Technology Centers in Huntington, Charleston, Bridgeport and Rocket Center (near Keyser in West Virginia's Eastern Panhandle).

Our first satellite facility, the RCBI Charleston Advanced Manufacturing Technology Center, operates on the Marshall University Graduate College campus in South Charleston. It began serving industry in December 1997. The RCBI Bridgeport Advanced Manufacturing Technology Center became operational in March 1998. The RCBI Rocket Center Advanced Manufacturing Technology Center, located on the grounds of a U.S. Navy-owned industrial site in the Eastern Panhandle, became fully operational in April 1998.

Each RCBI Advanced Manufacturing Technology Center is literally a "teaching factory," from which manufacturers and their workers can obtain hands-on, affordable experience – including both training and trial use – with computer-controlled mills, lathes and other state-of-the-market technologies they need to compete and succeed.

In addition to delivering customized instruction for industry's current work force, RCBI is creating a pool of technically skilled individuals who can go to work immediately in manufacturing plants. In 1998 RCBI established its nationally recognized and certified (by the National Institute for Metalworking Skills, or NIMS) Machinist Technology Program. This focused effort offers the kind of hands-on training necessary to prepare individuals for well-paid, and available, jobs in industry. Individuals can attend classes in Huntington, Bridgeport or Rocket Center. An option in our model program allows individuals to earn a career-enhancing Associate Degree from a local community college in addition to the RCBI certificate and individual NIMS credentials.

Providing direct, shop-floor assistance isn't the only focus of assistance provided at RCBI. In August 2003, RCBI debuted *Capacity*. RCBI's national magazine focuses on manufacturing and draws attention to its opportunities as well as the challenging and complicated issues faced by industry.

Today – more than 20 years and 5,000-plus satisfied manufacturers (that employ nearly 81,000 individuals) later – RCBI remains committed to our initial goal of providing access to cutting edge equipment, advanced technologies and technical skills training on a statewide and regional basis. In addition, and as a key component of assisting manufacturers, RCBI strives to develop, support and enhance a quality, just-in-time supplier base of manufacturers for the Department of Defense (DoD), NASA and the commercial sector.

RCBI enhances the supplier base component of our mission through the RCBI 21ST Century Manufacturing Network (www.21stmanufacturing.org). Online since 1997, the RCBI network is a computerized clearinghouse of more than 400 companies designed to help companies network and reach new markets, including contract opportunities from the DoD, NASA and commercial operations.

The RCBI Master & Advanced Solder Center of Excellence provides certification and training from a high-tech facility that features professional soldering, high clarity projection graphics and fully outfitted solder stations that meet or exceed rigorous industry standards. With this focus, RCBI assists in the development of practical solder skills for industry across the Mid-Atlantic region.

RCBI offers Additive Manufacturing (AM) technology, available in our Design Works labs that offer manufacturers, inventors and entrepreneurs the tools they need to take their ideas from concept to reality. We can help shape your ideas into 3-dimensional digital computer models that are used to create a working prototype in our 3D Printers. The prototype can be used to test the form, fit and function of the end-use product before costly production begins. Design Works offers reverse engineering, dimensional inspections and CAD (Computer-Aided Design) assistance. Our labs offer an array of specialized software including SolidWorks, Rapidform, Mastercam, Geomagic, FARO CAM2, DeSignWorks, CMM-Manager and 3D-Doctor. Using a digital file our 3D Printer lays down layer upon layer of material, creating an actual item - just as you imagined it!

Since operations began, RCBI has served manufacturers and entrepreneurs across West Virginia and its expanded service region. Further, RCBI has provided technical skills training -- including workforce development efforts and customized assistance -- to 5,000-plus companies that employ from two to more than 2,000 workers.

MISSION

The Robert C. Byrd Institute for Advanced Flexible Manufacturing provides statewide and regional access to advanced technology and technical training for manufacturers and entrepreneurs. The mission of RCBI is to develop a quality, just-in-time, supplier base for the Department of Defense, the National Aeronautics and Space Administration and the commercial sector.

RCBI fulfills its training mission through composites and technical skills training, quality and management systems training, business and professional development training, as well as general education and career education in collaboration with degree-granting institutions.

FACILITIES



RCBI Huntington

1050 Fourth Avenue
Huntington, WV 25701

p: 304.781.1625 or 800.469.RCBI (7224)
f: 304.781.1623



RCBI Charleston

100 Angus E. Peyton Drive
South Charleston, WV 25303

p: 304.720.7741
f: 304.746.8926



RCBI Bridgeport

2400 E. Benedum Industrial Drive
Bridgeport, WV 26330

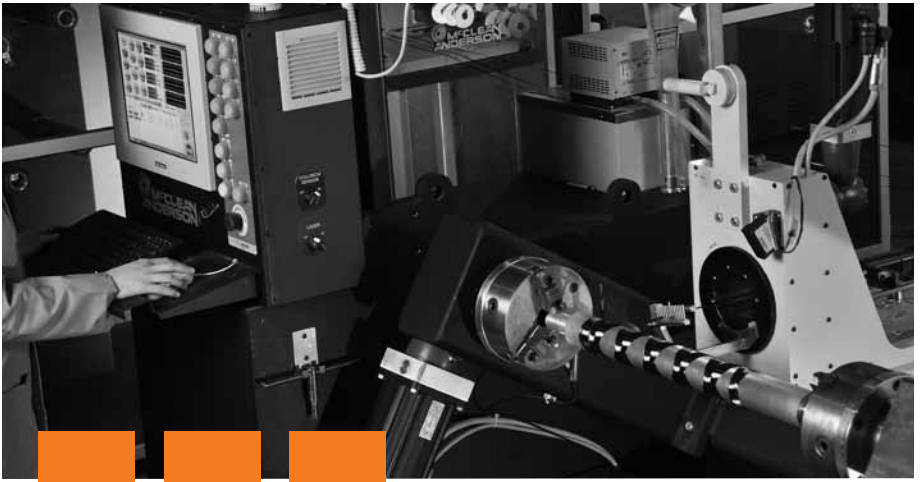
p: 304.848.2270
f: 304.842.0436



RCBI Rocket Center

410 State Route 956
Rocket Center, WV 26726

p: 304.597.2010
f: 304.726.7048



EQUIPMENT

RCBI offers affordable lease rates on CNC equipment at each of its Advanced Manufacturing Technology Centers. Available technology includes manufacturing, production, prototyping, reverse engineering and direct digital manufacturing equipment, computer labs and video-conferencing facilities. Operator training and technical services, including programming assistance, is always available. Equipment includes:

- Z Corporation Multicolor 3D Printer for Additive Manufacturing (AM)
- Fortus 3D printer for Additive Manufacturing (AM)
- Dimension 3D printer for Additive Manufacturing (AM)
- 2000- and 4000-watt laser cutters
- 3- and 4-axis machining centers
- 2- and 4-axis turning centers
- Turning center with live tooling
- High precision CNC hydraulic press brake
- Abrasive water jets
- 4-axis CNC wire EDM
- Swiss turn machines
- Instron tensile/compression tester
- 4-axis filament winder
- 5-axis high speed CNC router
- 625 sq. ft. cleanroom
- 6' x 10' autoclave
- 6' x 6' x 5' industrial oven to heat treat, finish, dry or cure
- Coordinate measurement machines (CMMs)
- FARO arms for reverse engineering and inspection, with laser scanning attachment
- HandyScan for reverse engineering and digital scanning
- Laser tracker
- Real-time X-ray NDT

ACCREDITATION AND CERTIFICATION

Recognized and certified by the National Institute for Metalworking Skills (NIMS), the RCBI Machinist Technology Program focuses on delivering industry-identified skill sets to students and prepares them to earn their own set of individual NIMS credentials. NIMS accreditation sends a powerful message that the program meets national industry standards.

The Clean Air Technology “Softwall” Cleanroom at the RCBI Composites Technology & Training Center was designated as passing standards for an ISO 14644-1 and ISO 14644-2 Class 6 clean zone/Fed Standard 209E Class 1000.

By achieving and maintaining rigorous industry standards, RCBI is reinforcing its commitment to the quality-approach that it advocates every day to manufacturers.

VISION

RCBI will be a recognized leader in manufacturing skills training using state-of-the-art and state-of-the-market equipment as well as the latest technologies.

VALUES

Quality is a goal in every facet of RCBI, and continuous improvement is expected and supported.

Individuals who complete programs at RCBI have the right to expect to develop or enhance the skill sets necessary to work in the manufacturing sector.

All individuals have worth and deserve being treated with consideration and respect.

EQUAL OPPORTUNITY / AFFIRMATIVE ACTION POLICY

RCBI provides equal opportunities to all prospective and current students and workers without regard to race, color, religion, sex, age, sexual orientation, disability or national origin.

GOALS

Establish, maintain and expand partnerships with industry, education, businesses and agencies.

Develop a skilled workforce to support the economic development of the community, state and region.

Measure outcomes and embrace a culture of continuous improvement to increase the value of the training experience.

CODE OF CONDUCT

CONDUCT

A student at RCBI is required to conduct himself/herself in a manner compatible with RCBI's role as an Advanced Manufacturing Technology Center and in keeping with federal, state and local laws. In turn, RCBI is responsible for holding students to this standard.

The following misconduct is subject to review and disciplinary action by RCBI, including probation, suspension or dismissal as well as possible prosecution in the civil courts:

- Theft, defacement or damage to RCBI property or of a member of the RCBI community or a visitor.
- Obstruction or disruption of teaching, administration, public service functions or other institution-sponsored activities by obscene or disorderly conduct.
- Physical or verbal abuse that threatens, offends or endangers the health or safety of a member of the RCBI community or a visitor.
- Failure to comply with directives of RCBI staff members acting in the performance of their duties, including refusal to furnish identification upon request.
- All forms of dishonesty including cheating, plagiarism and forgery.
- Violation of local, state or federal laws on RCBI premises.

POLICIES

1. Attendance

There is zero tolerance for lateness to or absences from class or shop-floor activities except for illness. Absence from any class requires a call to the instructor at least 15 minutes before class is to begin.

A student who is tardy more than five minutes should wait until the class break to enter class. This avoids the late entry into and disturbance of the class and the instructor's focus.

All time missed requires a make-up period at the instructor's convenience. The student who is absent from class should confer with the instructor as soon as the student can schedule a meeting with the instructor.

All absences and lateness for class will be a part of the student's record.

2. Dress, Hair and Jewelry

Clothes are to be clean and in good repair at all times. Hair and beards are to be kept clean and neat. Hair length that is long enough to be a safety hazard must be kept under a cap or secured in another way to avoid injury to one's self. Any jewelry may present a safety hazard. Please follow instructions from your instructor.

3. Alcohol and Drug

When an instructor observes the smell of alcohol on a student or action of a student which indicates he/she may be impaired the instructor is required to immediately remove the student from the class. Before the student may return to class he/she must meet with the instructor to discuss his/her behavior.

The instructor may recommend that the student withdraw from the class. If the student is permitted to return to the class he/she will be warned that a repeat of his/her behavior will require dismissal from the program. The student has the right to appeal any action taken to the instructor's supervisor.

4. Cell Phone

When entering a class students must turn cell phones and other electronic devices to the off position. No calls or texting may be made or received in class.

Use of cell phones during a class is disruptive to the class and the instructor, and can be a safety hazard.

5. Personal Conduct

Conduct yourself in the shop area in a manner that will not endanger yourself or your classmates. "Horse play" and any other unsafe behavior in the shop will be disciplined up to and including dismissal from the program.

6. Tardy and Absence

Programs at RCBI require the development of knowledge and skills. This requires hours of practice, which are difficult to make up.

1. Entering class late disturbs other students and the instructor. If you are 5 minutes late wait until the class break to enter.
2. Being absent or tardy two times requires a meeting with the instructor. Absence and lateness show a lack of commitment. These will be entered into your record.
3. Class time missed must be made up at the instructor's convenience.
4. If after counseling you continue to be tardy or late the instructor will question your commitment. At this time you may be withdrawn from the program.
5. All absences and lateness will be part of your record.
6. You have the right to appeal any disciplinary action to the instructor's supervisor.

7. Personal Property

Personal property of a student may not be taken or used by another student without audible consent from the property's owner.

In a community of students there may be occasion where sharing tools is desirable, but it must always be approved by the property's owner.

Violations of this policy should be reported to the instructor by the property's owner.

8. Academic Dishonesty

Definitions of academic dishonesty include the unauthorized use of:

- Materials, notes, sources of information, study aids or tools during an academic exercise (academic exercises as listed under Assessment of Learning Outcomes in each course's Course Information plan)
- Assistance of a person other than the instructor during an academic exercise.
- Viewing of another person's work during an academic exercise.
- Securing of all or any part of assignment or examinations, in advance of submission by an instructor.

9. Holiday

RCBI follows your college's schedule for holidays.

10. Inclement Weather

Program classes at RCBI in Huntington and Bridgeport will operate on the Marshall University schedule for emergency closing due to weather conditions. Students should listen for Marshall University announcements on local media outlets for announcements concerning weather conditions.

Programs of RCBI, located in areas other than Huntington or Bridgeport, will follow Inclement Weather announcements provided by the institution granting academic credit for the program.

11. Responsibilities of Students

RCBI programs are designed to help you develop the knowledge and skills to enter the manufacturing industry. BUT YOU WILL NEED MORE! You will also develop work habits that will help you obtain, maintain and advance in your career. The following are expectations which will move you toward your goal to enter the workforce in a machine shop or factory.

1. Miss class only when you are sick.
 - Note item 4 listed in the Tardy and Absence section.
2. Attending class is important. If you must miss class, please inform your instructor 15 minutes before class is to begin.
3. Keep a record of the times you miss class, your instructor will.
4. Punch in prior to the time class is to begin.
5. Punch out after the instructor dismisses class.
6. Be in class or at your work station as scheduled. Lateness will not be tolerated.
7. Complete all assignments and projects on time.
8. Know when, where and how to ask for assistance.
9. Learn how to work in an environment with other students. Remember you are in training to become an employee in the manufacturing industry. Learning to comply with rules is part of your training. Employers will ask about your skills. They will also be concerned about your work habits.
10. Maintaining Equipment in the Shop and Computer Laboratory
 - Negligence resulting in property damage could include liability.

STRATEGIC PARTNERS

The Robert C. Byrd Institute gratefully acknowledges our many valuable strategic partners that help us enable manufacturers to build a stronger economic future for West Virginia and the region:

Abaris Training Resources Inc.
Allegany County (Maryland) Career Center
Allegheny College of Maryland - Cumberland Campus
Best Incorporated
Bluefield State College
Bridgemont Community and Technical College
Cabell County Career Technology Center
Charleston Area Alliance
Chemical Alliance Zone
Concord University
Department of Defense / DARPA
Harrison County Chamber of Commerce
Huntington Area Development Council (HADCO)
Huntington Regional Chamber of Commerce
Kanawha Valley Community & Technical College
Lockheed Martin
ManTech International Corporation
Marshall University
Mid-Atlantic Aerospace Complex (MAAC)
Mineral County Chamber of Commerce
Morgantown Area Chamber of Commerce
Mountwest Community & Technical College (MCTC)
NASA
NASA Goddard Space Flight Center
NASA Langley Research Center
NASA's Mid-Atlantic Regional Technology Transfer Center
National Association of Manufacturers (NAM)
National Composites Consortium
National Institute for Metalworking Skills (NIMS)
National Technological University
Northwest Metrology
Pierpont Community and Technical College
Polymer Alliance Zone
Potomac State College of West Virginia University
Regional Contracting Assistance Center (RCAC)
Society of Manufacturing Engineers (SME)
TechConnectWV
TechSolve
ToolingU.com
U.S. Navy
United Technical Center
The University of Akron Wayne College
Veterans Affairs Administration
West Virginia Army National Guard
West Virginia Chamber of Commerce
West Virginia Development Office

West Virginia Governor's Office of Technology
West Virginia High Technology Consortium Foundation
West Virginia Manufacturers Association
West Virginia Small Business Development Center (WWSBDC)
West Virginia University
West Virginia University at Parkersburg
West Virginia University Institute of Technology
West Virginia Vocational-Technical Centers
Workforce Investment Act
Workforce West Virginia
Zane State Community College

TRAINING OPTIONS

Customized Training Delivered at RCBI or at Client Site

RCBI's technical training courses offer expert instruction and economies of scale. Training services at RCBI, like its other services offerings, are available 24/7, 365 days a year to meet the needs of our region's industrial base. On request, RCBI will create customized training to meet the specific workforce development needs of individual companies and their employees. RCBI's customized training can occur at any of our statewide Advanced Manufacturing Technology Centers or on-site at your location – whichever best suits your specific needs. Contact RCBI about your company's training needs. Call 800.469.RCBI (7224) or e-mail register@rcbi.org.

Classroom-based Training

Classroom training is available at each RCBI Advanced Manufacturing Technology Center.

Other classroom sites are available through agreements with RCBI's strategic partners.

In-shop Training

Hands-on training is available at each RCBI Advanced Manufacturing Technology Center on our machines and equipment.

Video Conferencing

Video conferencing is available at each RCBI Advanced Manufacturing Technology Center and can also be delivered to other off-site locations with compatible equipment to video conference course lectures.

Online/Independent Study Programs and Courses

Online programs/courses are available for many of RCBI's general technical courses. The Mechanical and Electrical Multicraft Program courses are available Online or through paper-based independent study. Additional hands-on, practical experience may be necessary for completion of requirements and will be conducted at employer locations or RCBI facilities.



**ASSOCIATE DEGREE,
CERTIFICATE,
SKILL-SET AND
JOB-SPECIFIC
PROGRAMS**

CAREERS -- AND GOOD JOBS -- START HERE!

Looking for a career? RCBI can help.

The technical skills you learn at RCBI make it possible for you to enter a shop floor setting and begin work immediately, earning good wages with benefits, knowing that your career is building.

Because RCBI has set up its courses and curriculum from the perspective of industry and employer-needs, the skills you develop at RCBI prepare you to take on the rigorous demands and perform work that will start your career.

Of course job-specific skill programs are the easiest and fastest way to prepare for a particular set of job responsibilities. Each of the programs we offer includes a skills assessment test, a recommended sequence of program classes and access to RCBI's experienced staff.

Each particular program's curriculum is offered Online and/or classroom facilitated. Additional hands-on, practical experience may be necessary to complete requirements and will be conducted at employer locations or statewide at RCBI Advanced Manufacturing Technology Centers.

DEGREE-SEEKING STUDENT ADMISSION REQUIREMENTS AND POLICIES

Individuals who seek an Associate of Applied Science in Technical Studies degree through partnerships among RCBI and local community and technical colleges must meet the requirements and follow the policies of their college to enter and remain in the program. For more information, consult the appropriate college catalog or call 800.469.RCBI (7224). RCBI partners with Mountwest Community & Technical College in Huntington, W. Va. and Potomac State College of West Virginia University in Keyser, W. Va.

Policies for Registration Deadlines, Readmission, Transfer Students, Transfer to Other Colleges and Institutions, Cancellation, Attendance, Grading, Unsatisfactory Progress, Dismissal and Liability are listed in the degree-granting college's current catalog for the Machinist Technology/CNC (Computer-Numerical-Control) Specialist and Welding Technology Associate of Applied Science in Technical Studies Degrees.

FINANCIAL INFORMATION

Tuition and Fees

Degree-seeking students will pay the applicable tuition and fees charged by the degree-granting college at the time of enrollment. See the college website or financial aid office for current tuition schedules.

Financial Assistance and Scholarships

Financial aid may be available to qualifying degree-seeking students who enroll in the two-year Associate in Applied Science Degree in Technical Studies: Machinist Technology/CNC or Welding Technology program options. Applications are processed by the partner college's Financial Assistance Office. For assistance in completing the Free Application for Student Aid (FAFSA), contact your college.

Workforce Investment Act (WIA): Adult and dislocated-worker training requires the use of Individual Training Accounts (ITAs). Individuals should apply at their local Workforce West Virginia Center.

Veterans Upward Bound: To be eligible a veteran must not have been dishonorably discharged and must have served for more than 180 days of continuous active duty with at least a portion after January 31, 1955, or was discharged or released for a service connected disability after the same date, and the veteran must be a first-generation college student, meaning neither parent has a four-year baccalaureate degree, or the veteran's "Family Taxable Income" must meet income guidelines established by U.S. Department of Education, or both.

Company Sponsored: A student's employer may contract with RCBI to pay for workplace skills training.

Private Pay: At time of registration, student must provide one of the following:

- Check, payable to the degree-granting community college
- Visa or MasterCard account number, expiration date, account holder name and current billing address

NON-DEGREE-SEEKING STUDENT ADMISSION REQUIREMENTS AND POLICIES

Individuals who enroll in classes at RCBI for career development, job skills improvement or reasons other than a degree, may enroll in an RCBI certificate program or RCBI course of study by applying online at www.rcbi.org or contacting RCBI's Director of Workforce Development at 800.469.RCBI (7224).

POLICIES FOR NON-DEGREE SEEKING STUDENTS

Registration Deadlines

Students must register one week (seven calendar days) prior to the scheduled start date. Late registrations may be accepted with prior approval from the Director of Workforce Development at RCBI.

Readmission

Individuals who have not attended RCBI training during the past six months are required to apply for readmission by completing a new RCBI application and contacting the Director of Workforce Development at 800.469.RCBI (7724) to apply for readmission. You must have paid all tuition and fees from previous registration(s) to be considered for reenrollment.

Transfer Students

Students may transfer to RCBI from other institutions by submitting an application and official transcript from all previous institutions or military training for consideration of transferability of hours earned.

Transfer to Other Colleges and Institutions

Non-Degree-seeking credits/hours are generally considered non-transferrable and are taken for career enhancement and job readiness purposes. Transfer options may be available. Consult with the Director of Workforce Development at 800.469.RCBI (7224) for options.

Cancellation Policies

Cancellation of registration by student or company: If you cancel your registration at least eight calendar days prior to the scheduled course, you will receive a full refund.

If you cancel your registration within seven calendar days of the scheduled course, you will be charged the total cost of the course.

You will be billed according to this policy if you have not followed these provisions.

Cancellation of course by RCBI: If a sufficient number of participants are not enrolled by the course's registration deadline and the course is cancelled by RCBI, you will receive a full refund. If a course is canceled by RCBI, registered students will be given alternate dates of re-scheduled courses to meet their needs.

Attendance

Attendance will be taken during each class session. Students are expected to be on time and in class every course. RCBI has a zero tolerance policy for unexcused absences or tardiness. If absent from a class, the student is required to contact the instructor for permission to continue in the class.

Grading

Non-degree programs/classes are graded on a pass/fail system. Certificates of completion are granted to students after their successful completion of the program or course.

Unsatisfactory Progress

If a student is making unsatisfactory progress in a program or class, the instructor will meet with and counsel the student regarding steps to correct deficiencies and give written notice to the student of any steps required to meet the standards necessary complete the program or course.

If a student continues to make unsatisfactory progress after counseling and remedial steps, the student will be dismissed from the program or course. The student may appeal a dismissal by writing to the Director of Manufacturing Services (RCBI Charleston, 100 Angus E. Peyton Drive, South Charleston, WV 25303).

Dismissal

A student may be dismissed from a course or program for cheating, disruption of class activities, excessive tardiness or absences or other behavior deemed subject to dismissal by the instructor. The student is entitled to written notice of dismissal including the reason for the dismissal and how, if possible, the student may correct the situation and what penalty may be imposed if the student is allowed to return to class.

The student shall be given the opportunity to meet with the instructor to discuss the behavior leading to the dismissal and what steps, if any, may be taken to allow the student to return to class. The student will also be given the option of meeting with the Director of Manufacturing Services to appeal the dismissal and any penalties imposed.

Liability

RCBI assumes no responsibility for loss of nor damage to the personal property of students. Further, RCBI cannot assume responsibility for personal injury to students.

FINANCIAL INFORMATION

Tuition and Fees

Tuition and fees are subject to change; please request an addendum to the catalog or view course information online at www.rcbi.org.

Course Billing

Companies may pre-pay or provide a purchase order number and be invoiced at the course's completion.

Multiple Attendee Discounts

When a client/company enrolls two or more individuals, a 10 percent discount will be applied to the final invoice.

Financial Assistance and Scholarships

Financial assistance may be available, depending on program and eligibility requirements. Contact the Director of Workforce Development at 800.469.RCBI (7224) for details.

Workforce Investment Act (WIA): Adult and dislocated-worker training requires the use of Individual Training Accounts (ITAs); Individuals should apply at their local Workforce West Virginia Center.

Veterans Upward Bound: To be eligible a veteran must not have been dishonorably discharged and must have served for more than 180 days of continuous active duty with at least a portion after January 31, 1955, or was discharged or released for a service connected disability after the same date, and the veteran must be a first-generation college student, meaning neither parent has a four-year baccalaureate degree, or the veteran's "Family Taxable Income" must meet income guidelines established by U.S. Department of Education, or both.

Company Sponsored: A student's employer may contract with RCBI to pay for workplace skills training.

Private Pay: At time of registration, student must provide one of the following:

- Check, payable to the Robert C. Byrd Institute
- Visa or MasterCard account number, expiration date, account holder name and current billing address

PROGRAMS

THE MACHINIST TECHNOLOGY PROGRAM AT RCBI

MACHINIST TECHNOLOGY/CNC (COMPUTER-NUMERICAL-CONTROL) ASSOCIATE IN APPLIED SCIENCE DEGREE

MACHINIST TECHNOLOGY TECHNICAL TRAINING CERTIFICATE

MACHINIST TECHNOLOGY SKILL-SET

The Machinist Technology Program at the Robert C. Byrd Institute for Advanced Flexible Manufacturing (RCBI) provides students the opportunity to prepare for entry level careers as machinists using conventional and computer-numerical-control equipment. The graduate will have completed the fundamentals of industrial safety, blueprint reading and precision measurement that are required for all machining careers. Technical courses also develop skills using conventional machines and computer-controlled manufacturing equipment.

Participants who choose to enroll in the Technical Training Certificate option of the Machinist Technology Program at RCBI receive technical skills training to work in industrial machining. Course work includes manual machine operation and technical support, introductory CNC (computer-numerical-control) machine operation and technical support, oral communications and organizational skills, mathematics for machinists and safety issues.

Program Prerequisites

The RCBI Machinist Technology Program is not an open enrollment program. An entrance exam is administered and evaluated to determine an applicant's eligibility to enroll in the program. Each applicant is required to submit high school transcripts, attendance records and ACT or SAT scores. In addition, each applicant is required to take an entrance exam and interview with RCBI staff. After a review of your application, we will contact you to schedule an interview and schedule your entrance exam.

The graduate will have developed fundamentals required for all machining careers – industrial safety, blueprint reading and precision measurement. Technical courses develop skills using conventional and computerized manufacturing equipment. General education courses are provided by Potomac State College of West Virginia University or Mountwest Community & Technical College (MCTC).

The Associate Degree option requires four semesters. However, the student may elect to complete the program at the Certificate level, in two semesters, or at the Skill-set level. The course work in these two training levels is an integral part of the degree-option program. If you have any questions about your specific program requirements, consult with a Workforce Recruiter at RCBI.

RCBI is accredited by and adheres to standards set by the National Institute for Metalworking Skills (NIMS). The colleges that provide academic course credit and the Associate degree are accredited by the Higher Education Commission of the North Central Association of Colleges and Schools.

Employment Opportunities

- CAD Operator
- CNC Programmer
- CAM Specialist
- Engineering Designer
- Engineering Technician
- Mechanical Design Engineer
- Mechanical Drafter
- Product Designer

Program Year One

The first two semesters are designed to develop knowledge and skills in conventional machining. Completing course work permits students to pursue careers using conventional machines. The student will:

- Demonstrate a safety attitude and conduct himself/herself in a safe way in the classroom and shop.
- Apply mathematical skills appropriate to conventional machining.
- Read and interpret blueprints used in the machine shop.
- Select and use the correct measurement instruments in shop work.
- Identify and describe the function of shop machines.
- Complete assigned projects in the assigned time.
- Demonstrate appropriate improvement in skills using shop equipment.
- Complete NIMS projects on time.
- Demonstrate a positive attitude and work habits in a professional manner.

Program Year Two

The second two semesters focus on CNC (Computer-Numerical-Control) Technology. Completing this course-work permits students to pursue entry-level careers in CNC machining. Individuals also may use the course-work to upgrade their current manufacturing skills. Students who complete this course of study will:

- Apply knowledge and skills in fundamentals of machining to CNC machining.
- Demonstrate mathematical skills appropriate for CNC machining.
- Demonstrate a positive attitude and work habits in a professional manner.
- Understand and use G- and M-code language of the CNC controller.
- Set up projects on the mill and lathe.
- Make work offsets and tool offsets.
- Write line by line programs.
- Edit programs.
- Show understanding and ability to solve CNC program problems.
- Make drawings and post process to the software for G- and M-code program's tool path.
- Apply concepts of CAD/CAM to CNC machining.
- Complete the NIMS project on time.
- Demonstrate the ability to adjust to changing procedures in the workplace.

THE CNC SPECIALIST PROGRAM AT RCBI

Participants in the Technical Training Certificate option of the CNC Specialist Program at RCBI learn technical skills immediately useful in the workplace requiring CNC knowledge. It covers hands-on instruction in set up, operation, programming and maintenance on state-of-the-market CNC equipment used every day in industry. The program also delivers instruction in industrial communications, organizational skills, mathematics for machinists and safety. Before graduation, each individual is required to pass both Level 1 NIMS CNC credentials (Milling and Turning).

THE WELDING TECHNOLOGY PROGRAM AT RCBI

The Welding Technology Program at the Robert C. Byrd Institute for Advanced Flexible Manufacturing (RCBI) in partnership with Cabell County Career Technology Center (CCCTC) is an industry-driven, hands-on program that prepares individuals to meet the rigorous demands of the manufacturing sector. An option in the RCBI program enables students to earn an Associate in Applied Science in Technical Studies degree by completing additional course work through Mountwest Community & Technical College (MCTC).

Program Admission Requirements

The Welding Technology Program is not an open enrollment program, and has admission and candidacy requirements in addition to college admission guidelines. Components of the program include general education, technical core, classroom and welding lab hands-on instruction in the occupational area as well as an on-the-job internship.

The Welding Technology Program delivers skills that an individual needs to be successful in industry. This is accomplished through a hands-on approach and intensive student instructor interaction. The best way to learn to weld is by actually welding. Thus the focus is put on work that's done outside the traditional classroom in a shop setting, providing the student a true feel for the correct way to weld. A major subject is safety and this program teaches individuals how to protect themselves and their environment while completing the job. Students learn a variety of welding methods including TIG, MIG, SMAW and Stick Pipe, as well as metal cutting techniques to ensure they have developed the necessary skills expected by employers. This program provides new welders a firm foundation to earn certification and thrive in the field.

Comprehensive full- and part-time programs are available, thus enabling current workforce members to improve their technical skills and develop professionally while helping their employers become more competitive.

THE MANUFACTURING SOFTWARE PROGRAM AT RCBI

The RCBI Manufacturing Software Program includes intense focus on key CAD/CAM software that enables companies to streamline their manufacturing processes, reduce lead times, increase production efficiency, reduce operational costs, improve products, enhance customer service, enter new markets and improve profitability. The software packages include Mastercam, FeatureCAM, SolidWorks, Rapidform, Geomagic, FARO CAM2, DeSignWorks and CMM-Manager. These packages of drawing, modeling, simulation, imaging, rendering, reverse engineering and measurement software, widely used in industry, will benefit both industry and its workforce by providing experienced individuals who can produce drawings necessary to manufacture quality parts for Department of Defense (DoD) suppliers, mining equipment suppliers, the automotive, energy and aerospace sectors as well as other industries across West Virginia and the region.

THE MECHANICAL & ELECTRICAL MULTICRAFT MAINTENANCE PROGRAM AT RCBI

The Multicraft Program at RCBI is designed for individuals who are being trained for both mechanical and electrical maintenance duties. The program teaches the fundamentals and covers general safety issues when dealing with electricity as well as corresponding concerns with mechanical fundamentals, so students can better understand how to deal with both components of machinery and operations. Graduates of the program will gain the upper hand on maintenance workers who specialize in just one area.

ARC WELDER PROGRAM

Arc welders are responsible for joining metal parts by melting the joint with heat generated by an electrical current. This position demands an understanding of electrical conductivity and circuits, arc welding equipment and processes, properties of metals, and blueprint reading. Arc welders often work indoors and outdoors in a variety of settings and must know proper safety practices.

ASSEMBLER PROGRAM

Assemblers are responsible for joining separate components into finished goods ranging from small, detailed products to heavy equipment. This position demands an understanding of mechanical fasteners and torque, methods for inspecting finished parts, basic welding principles, and blueprint reading skills. Assemblers often work in teams and benefit from learning quality methods such as lean systems and cell design.

ASSEMBLER: ELECTRICAL PROGRAM

Electrical assemblers are responsible for joining electrical components into a finished product. This position demands an understanding of electrical circuits and components, mechanical fasteners and torque, methods for inspecting finished parts, and blueprint reading skills. Electrical assemblers often work in teams and benefit from learning quality methods such as lean systems and cell design.

CNC OPERATOR: LATHE PROGRAM

CNC lathe operators are responsible for production work of a job previously set up on a CNC turning center. This position demands an understanding of CNC coordinate systems and offsets, basic G-code programming, part inspection, blueprint reading and cutting tool theory. Some CNC lathe operators may also be involved in machine setup and can benefit from setup reduction practices.

CNC OPERATOR: MILL PROGRAM

CNC mill operators are responsible for production work of a job previously set up on a CNC machining center. This position demands an understanding of CNC coordinate systems and offsets, basic G-code programming, part inspection, blueprint reading and cutting tool theory. Some CNC mill operators may also be involved in machine setup and can benefit from setup reduction practices.

CNC PROGRAMMER PROGRAM

CNC programmers are responsible for creating part programs based on part designs that are then run on CNC lathes and mills. This position demands a solid understanding of G-code programming, part dimensioning, workpiece materials, speeds and feeds, cutting tool theory, and workholding setups. CNC programmers may also be involved in various quality efforts to reduce setup times or improve process control.

ELECTRICIAN: INDUSTRIAL PROGRAM

Industrial electricians are responsible for troubleshooting and repairing a wide range of industrial equipment and electrical systems. This position demands a thorough knowledge of electrical circuits and components, mechanical fasteners and hand tools, mechanical drives, and a broad knowledge of industrial machines. Industrial electricians also benefit from learning preventive maintenance and similar approaches.

INDUSTRIAL SALES PROGRAM

Industrial salespeople are responsible for selling a wide range of manufacturing products to industrial customers and may be relatively new to the industry. This position requires a familiarity with grinding tools, cutting tools, fasteners and hand tools, punch and die components, and other assorted tooling components. Industrial salespeople can also benefit from learning recent quality initiatives and process improvement methods.

INSPECTOR: MECHANICAL PROGRAM

Inspectors are responsible for verifying the quality of products and ensuring that products meet their specifications. This position demands a strong knowledge of math and blueprint reading, geometric dimensioning and tolerancing, advanced inspection tools such as CMMs and optical comparators, locating principles, and a working knowledge of common manufacturing processes. Inspectors are also likely to be involved in quality initiatives and process control.

MACHINIST/MACHINE SETTER PROGRAM

Machinists and machine setters are skilled machine tool operators capable of working with both lathes and mills, as well as both manual and CNC machines. This position demands an understanding of cutting tool theory, CNC coordinate systems, basic G-code programming, manual machining, part inspection and workpiece material properties. General machinists and machine setters also are expected to have excellent blueprint reading and math skills and will likely perform first-time setups for new jobs.

MACHINIST: TOOL ROOM PROGRAM

Tool room machinists are skilled, hands-on machine tool operators capable of working with lathes, mills and grinders. This position demands an understanding of manual machine operation, cutting tool theory, part inspection, grinding operations and workpiece material properties. Tool room machinists also are expected to have excellent blueprint reading and math skills.

MAINTENANCE AND REPAIR: GENERAL PROGRAM

General maintenance and repair workers are responsible for maintaining and fixing a wide range of building systems and mechanical equipment. This position requires a broad knowledge of electrical systems and wiring, fluid systems and plumbing, mechanical drives and machines, hand tools and fasteners, as well as blueprint reading. General maintenance and repair workers also benefit from learning preventive maintenance and similar approaches.

MAINTENANCE AND REPAIR: INDUSTRIAL MACHINERY PROGRAM

Maintenance and repair workers for industrial machinery are responsible for maintaining, troubleshooting and repairing industrial equipment and machine tools. This position requires a thorough knowledge of electrical circuits and components, hydraulic and pneumatic systems, mechanical drives and components, hand tools and fasteners, welding equipment and a broad knowledge of manufacturing processes. Maintenance and repair workers for industrial machinery also benefit from learning Total Productive Maintenance (TPM) and similar approaches.

MANUFACTURING SURVEY PROGRAM

The class titles included in the Manufacturing Survey Program are designed to provide a broad overview of the manufacturing industry for executives, HR managers, supervisors or any other individuals who are new to the industry. The manufacturing survey addresses common processes and tooling in the machining, stamping and welding industries. Individuals who enroll in the Manufacturing Survey Program are also exposed to common quality initiatives and approaches.

MSSC (MANUFACTURING SKILL STANDARDS COUNCIL) PROGRAM

The Manufacturing Skill Standards Council (MSSC) Program prepares students for MSSC certification, an industry-led, training, assessment and certification system focused on the core skills and knowledge required by the nation's front-line production workers for today's manufacturers. The Certified Production Technician (CPT) addresses core technical competencies of higher skilled production workers in all sectors of manufacturing. Certificates are awarded to individuals who pass any of its Production Modules: Safety; Quality Practices & Measurement; Manufacturing Processes & Production, and Maintenance Awareness. A full Certified Production Technician (CPT) Certification is awarded to those who pass all four original modules.

NIMS PROGRAM

The National Institute for Metalworking Skills (NIMS) Program prepares students for NIMS certification. NIMS is a leading manufacturing organization that sets skills standards designed to develop and maintain a globally competitive American workforce. NIMS has developed skills standards in 24 operational areas that cover a full range of metalforming and machining disciplines. NIMS also offers certifications, through its credentialing program, that verify individuals have met both performance and theory requirements in manufacturing. RCBI is an approved NIMS credentialing center

PRESS BRAKE OPERATOR PROGRAM

Press brake operators are responsible for creating parts out of blanks by bending sheet metal between a punch and die mounted on the press. This position demands an understanding of the basic components of the press brake, the mechanical properties of metals, part inspection and quality assurance as well as basic blueprint reading. Press brake operators often conduct bending operations manually and must know the proper safety practices.

PRESS OPERATOR PROGRAM

Press operators are responsible for the routine production work of a coil-fed stamping press. This position requires knowledge of stamping operations and die components, inspection methods, math and blueprint reading as well as material properties. Press operators also benefit from learning die setting procedures and lean initiatives.

PRODUCTION GRINDER PROGRAM

Production grinders are responsible for the production work of jobs that are set up on a range of grinding machines. This position demands an understanding of grinding machines and processes, grinding wheel materials, blueprint reading and inspection methods as well as workpiece material properties. Some production grinders may also be involved in lean initiatives and cell designs.

PRODUCTION/MANUFACTURING ENGINEER PROGRAM

Production/Manufacturing engineers are responsible for managing large-scale production operations within their facility. This position requires a broad knowledge of machine tool operations and manufacturing processes, workpiece material properties, tool maintenance, workholding setups and OSHA safety regulations. Production/Manufacturing engineers also benefit from learning about lean initiatives, cell design and process improvement methods.

QUALITY/LEAN MANAGER PROGRAM

Quality/Lean managers are responsible for the continuous improvement of manufacturing processes, the quality assurance of products and the elimination of waste and inefficiency. This position requires knowledge of inspection methods and metrology processes, ISO 9000 and similar quality standards, Statistical Process Control (SPC) as well as lean metrics and approaches. Quality/Lean managers also benefit from a broad understanding of common manufacturing processes.

SALES ENGINEER PROGRAM

Sales engineers are responsible for selling technical products and solutions to industrial customers and most likely have previous sales experience in industry. This position requires a working knowledge of manufacturing processes and tooling, machine specifications and workpiece materials. Sales engineers also benefit from learning recent quality initiatives and process improvement methods.



TECHNICAL SKILLS COURSE DESCRIPTIONS

Your competition is no longer just the company around the corner; it's companies all over the world. Close the gap on the competition and bring the work home to your shop. Training results in increased job satisfaction and morale, and reduces employee turnover. RCBI provides affordable workforce development and technical training that is designed to meet your needs and the demands of the manufacturing sector. RCBI also offers to develop customized training for your specific needs. Use the RCBI advantage to advance your company's technical skills.

Technical Training Available at RCBI or On-site at Your Location

RCBI's customized training can take place at any of our statewide Advanced Manufacturing Technology Centers or on-site at your location – whichever best suits your needs. Contact RCBI about your company's training needs today. Call 800.469.RCBI (7224) or send an e-mail to register@rcbi.org.

ABRASIVES - These classes will explain abrasive processes used to shape and finish parts.

ADHESIVES - These classes explain fundamental concepts of adhesive bonding as they apply to product assembly.

CAD/CAM SOFTWARE - These classes focus on developing the necessary skills to use computer software to design and manufacture.

CNC - The classes explain machining operations performed with the help of the versatile CNC (computer-numerical-control) system.

COATINGS - These classes explain the fundamental nature of coatings and their application to both protect and improve products.

COMPOSITES - Taught by technical specialists, this series of hands-on courses and seminars focuses on practical applications in advanced composites materials.

ELECTRICAL - These classes explain the key concepts of electrical maintenance for individuals in the manufacturing environment.

FASTENERS - These classes cover the basic types of threaded and non-threaded fasteners.

HYDRAULICS AND PNEUMATICS - These classes explain the fundamental concepts of hydraulic and pneumatic systems for maintenance individuals in the manufacturing environment.

INSPECTION - These classes address the methods and measurement instruments used to effectively inspect parts in the shop.

MACHINIST TECHNOLOGY/CNC - These focused classes provide students the opportunity to prepare for entry level careers as machinists after experience with both conventional and computer-controlled equipment.

MANUAL MACHINING - These classes cover the basic components of the engine lathe and manual mill, and address how these components are used during the various cutting processes.

MATERIALS - These classes provide the background information necessary to understand why some manufacturing materials are better for certain applications than others.

MECHANICAL SYSTEMS - These classes explain fundamental concepts of mechanical maintenance for individuals in the manufacturing environment.

METAL CUTTING - The content is for individuals who need to understand the processes and products for traditional metal cutting on lathes, mills and drill presses.

MOTOR CONTROLS - These classes explain the fundamental concepts of designing, providing, and maintaining electrical control for motors.

PLCs - These classes cover the basics of ladder logic, binary numbering and basic programming principles used to control machinery.

PRESS BRAKES - These classes address basic principles necessary for safe operation of the press brake.

PROFESSIONAL DEVELOPMENT - To thrive in today's global economy, manufacturers are expected to have well-developed oral and written communication skills, work successfully in teams, and demonstrate an ability to solve manufacturing-related problems resourcefully.

QUALITY - Specialized courses in quality management theory and technique help ensure that you can become and remain an effective, sought-after and environmentally conscious supplier.

RIGGING - These classes cover the common equipment -- such as cable, chains, slings and hoists -- used to move loads, as well as the safety practices required in the shop.

ROBOTICS - These classes cover major components of industrial robots, the common applications for robots and axis movement.

SAFETY - Safety awareness is vital for any company or employee. Presented by experienced instructors to meet federal standards, these classes are a must for any manufacturing organization.

SHOP ESSENTIALS - These classes explain essential skills required in today's machine shop.

SOLDERING - These classes address the development of practical solder skills for industry as well as the knowledge and techniques required to produce high-quality, manually soldered joints.

STAMPING - These classes explain all the various aspects of forming sheet metal and coil on the press.

WELDING - These classes cover the basic components and common processes used during arc welding.

WORKHOLDING - The classes cover the subject of keeping your part in place, through locating and clamping, while you perform a machining operation.

ABRASIVES

Centerless Grinder Operation

This class addresses how to perform common grinding operations on the centerless grinder as well as methods for mounting and truing the grinding and regulating wheels.

Cylindrical Grinder Operation

This class identifies the main components of common cylindrical grinders and describes the various types of operations that can be performed.

Dressing and Truing

This class describes the common methods used to ring test balance true and dress a standard grinding wheel.

Grinding Processes

This class identifies the major types of grinding operations and explains how they are performed. It includes an interactive lab.

Grinding Variables

This class identifies the most common variables, including some problems that occur during grinding, and places an emphasis on speeds and feeds. It includes an interactive lab.

Grinding Wheel Geometry

This class describes the major types of grinding wheels listed in the ANSI standard and explains the relationship between wheel geometry and workpiece shape.

Grinding Wheel Materials

This class describes common abrasive and bond materials for grinding wheels, as well as their applications.

Introduction to Abrasives

This class defines abrasive processes and explains the major groups of abrasive tools.

Setup for Centerless Grinders

This class explains how to set up the main components of a centerless grinder, as well as how to accurately position the workpiece on the work rest blade for various centerless grinding operations.

Surface Grinder Operation

This class discusses the steps involved in grinding horizontal and vertical surfaces with a horizontal-spindle reciprocating-table grinding machine.

What Is Grinding?

This class describes the grinding action, explains how chips are formed and covers wheel maintenance and safety.

ADHESIVES

Basics of the Bonding Process

This class describes the basics of the adhesive bonding process, as well as the various solidification methods of adhesives.

Introduction to Adhesive Bonding

This class describes adhesive bonding, adhesive classification and the various factors that lead to a successful adhesive bond.

Introduction to Adhesive Properties

This class describes mechanical and non-mechanical properties of adhesives and addresses how they impact adhesive bonding.

Steps for Adhesive Application

This class discusses each step involved in the adhesive application process, as well as basic dispensing methods and methods of testing the effectiveness of the application process on the assembly line.

Surface Preparation

This class discusses surface factors that affect adhesion, the nature of the different types of surfaces used in adhesive bonding, as well as the methods of selecting and preparing a surface for adhesive bonding.

Types of Adhesives

This class describes the characteristics, pros and cons and applications of types of synthetic adhesives.

CAD/CAM SOFTWARE

Basic Laser Tracker and CAM2 Measure Training

This course provides hands-on demonstration of Laser Tracker setup initialization and operation. It covers basic features of CAM2 measurement software (version X or later) to perform inspection and digitizing of 2D part features, CAD-to-part alignment and surface point inspection, as well as free-hand scanning of 3D surfaces. The duration of this phase will be decided in consultation with the client.

CAD/CAM Overview

This class describes the general process of using computers to design and manufacture parts and identifies common features available in CAD/CAM software.

Computer-Aided Design - Introduction to 3D Modeling

This course provides hands-on demonstrations of a step-by-step construction of 3D wireframe, 3D surface and 3D solid models to make multiple projected view drawings. The course is designed to introduce CAD users to 10 tutorial style chapters of 3D modeling and working with user coordinate systems. Each chapter introduces a new set of commands and concepts, building on previous chapters.

FARO CAM2 Q

This class provides hands-on demonstration of FARO arm setup, initialization and operation. It covers the essential aspects of CAM2 Measure software and FARO arm operation, using a sample part for hands-on practice.

Inspecting with CMMs (Coordinate Measurement Machines)

This class compares the advantages and common uses of various CMM components and software applications.

Mastercam Advanced

Mastercam Advanced covers a multitude of features that allow students to create 3D Wireframe and surfaces for 3D modeling. Training exercises and drawings are provided to teach 3D geometry functionality. Surface and Advanced High Speed machining tool paths are covered, and instructions detail how to set Advanced Toolpath Refinement. Additional Mastercam files are included along with guidelines for creating the tool paths to successfully machine each part.

Mastercam Fundamentals

The focus of this class is on introducing Mastercam, a Computer-Aided-Manufacturing (CAM) software. Using its interactive graphical interface, students learn to create geometry in Mastercam or transfer it from a CAD package set up tools and related information, design tool paths and use graphical simulation functions for visual verification before generating machine code.

Mastercam Intermediate

The focus of this class is on Mastercam a Computer-Aided Manufacturing (CAM) software. Using its interactive graphical interface students learn to create 3D surface geometry in Mastercam design tool paths, and use graphical simulation functions for visual verification before generating machine code.

SolidWorks Essentials

This course teaches how to use SolidWorks mechanical design software to build parametric models of parts and assemblies. It is designed to give the foundation necessary for higher level courses. This course covers general parts modeling and how to make detailed drawings of parts.

CNC

Basics of the CNC Machining Center

This class describes the basic components of the machining center, as well as the devices used on this machine. It includes an interactive lab.

Basics of the CNC Swiss-type Lathe

This class describes basic components of the Swiss-type lathe, as well as common tooling and machining operations.

Basics of the CNC Turning Center

This class describes the basic components of the turning center, as well as the devices used on this machine. It includes an interactive lab.

Canned Cycles

This class describes the operation of common canned cycles that appear on machining and turning centers. It includes an interactive lab.

CNC Coordinates

This class explains the arrangement and orientation of the basic axes on a common CNC lathe and both a vertical and horizontal CNC mill. It includes an interactive lab.

CNC Introduction to Machining, Operation and Programming - Level One MT 280

This class introduces basic CNC operation and programming with a hands-on laboratory experience. The application of basic machining is stressed with focus on CNC turning and milling. G- and M-code and IGF programming are used, as well as introduction to CAD/CAM programming with Mastercam and/or Gibbs software.

CNC Manual Operations

This class describes the control features that allow a CNC operator to execute tasks manually. It includes an interactive lab.

CNC Offsets

This class identifies various offsets used on both the lathe and the mill to properly reference each cutting tool in relationship to the workpiece. It includes an interactive lab.

CNC Specifications for the Lathe

This class identifies common specifications of CNC lathes and describes the various features and options available on different machines.

CNC Specifications for the Mill

This class identifies common specifications of CNC mills and describes the various features and options available on different machines.

Creating a Mazatrol Program for the Lathe

This class covers the basics of creating a simple turning program on the Mazatrol Smart lathe control. Topics include the basic units that comprise a Mazatrol program and the range of turning units available to make almost any turned part.

Creating a Mazatrol Program for the Mill

This class covers the basics of creating a simple milling program on the Mazatrol Matrix Mill control. Topics include the basic units that comprise a Mazatrol program and the range of machining units available to make almost any milled part.

Creating a Milling Program

This class explains the key components in the creation and execution of a simple milling program. It includes an interactive lab.

Creating a Turning Program

This class explains the key components in the creation and execution of a simple turning program. It includes an interactive lab.

Creating an EIA/ISO Program for the Mazak Lathe 287

This class explains key components in the creation and execution of a simple turning program.

Creating an EIA/ISO Program for the Mazak Mill 286

This class explains key components in the creation and execution of a simple milling program.

GE Fanuc Lathe: Control Panel Overview

This class describes various sections of the GE Fanuc 0-C lathe control panel, as well as the steps for powering up, powering down and homing the machine. It includes use of GE Fanuc CNC Simulators.

GE Fanuc Lathe: Entering Offsets

This class provides step-by-step instructions for adjusting offsets on the GE Fanuc 0-C lathe control during a production run. It includes use of GE Fanuc CNC Simulators.

GE Fanuc Lathe: First Part Runs

This class describes how to verify the accuracy of a program and make minor editing changes on the GE Fanuc 0-C lathe control. It includes use of GE Fanuc CNC Simulators.

GE Fanuc Lathe: Locating Program Zero

This class describes how to determine work offsets and tool geometry offsets on the GE Fanuc 0-C lathe control during setup. It includes use of GE Fanuc CNC Simulators.

GE Fanuc Lathe: Program Execution

This class describes the steps necessary to activate, execute and restart programs using the GE Fanuc 0-C control for the lathe. It includes use of GE Fanuc CNC Simulators.

GE Fanuc Lathe: Program Storage

This class describes common methods for transferring and storing part programs on the GE Fanuc 0-C lathe control. It includes use of GE Fanuc CNC Simulators.

GE Fanuc Mill: Control Panel Overview

This class describes various sections of the GE Fanuc 0-C mill control panel, as well as the steps for powering up, powering down, and homing the machine. It includes use of GE Fanuc CNC Simulators.

GE Fanuc Mill: Entering Offsets

This class provides step-by-step instructions for adjusting offsets on the GE Fanuc 0-C mill control during a production run. It includes use of GE Fanuc CNC Simulators.

GE Fanuc Mill: First Part Runs

This class describes how to verify the accuracy of a program and make minor editing changes on the GE Fanuc 0-C mill control. Includes use of GE Fanuc CNC Simulators.

GE Fanuc Mill: Locating Program Zero

This class describes how to determine work offsets and tool geometry offsets on the GE Fanuc 0-C mill control during setup. It includes use of GE Fanuc CNC Simulators.

GE Fanuc Mill: Program Execution

This class describes the steps necessary to activate, execute and restart programs using the GE Fanuc 0-C control for the mill. It includes use of GE Fanuc CNC Simulators.

GE Fanuc Mill: Program Storage

This class describes common methods for transferring and storing part programs on the GE Fanuc 0-C control for the mill. It includes use of GE Fanuc CNC Simulators.

Haas Lathe: Control Panel Overview

This class describes the various sections of the Haas lathe control panel, as well as the steps for powering up, powering down and homing the machine. It includes use of Haas CNC Simulators.

Haas Lathe: Entering Offsets

This class provides step-by-step instructions for adjusting offsets on the Haas lathe during a production run. It includes use of Haas CNC Simulators.

Haas Lathe: First Part Runs

This class describes how to verify the accuracy of a program and make minor editing changes on the Haas lathe. It includes use of Haas CNC Simulators.

Haas Lathe: Locating Program Zero

This class describes how to determine work offsets and tool geometry offsets on the Haas lathe during setup. It includes use of Haas CNC Simulators.

Haas Lathe: Program Execution

This class describes the steps necessary to activate, execute and restart programs on the Haas lathe. It includes use of Haas CNC Simulators.

Haas Lathe: Program Storage

This class describes common methods for transferring and storing part programs on the Haas lathe. It includes use of Haas CNC Simulators.

Haas Mill: Control Panel Overview

This class describes the various sections of the Haas mill control panel, as well as steps for powering up, powering down and homing the machine. It includes use of Haas CNC Simulators.

Haas Mill: Entering Offsets

This class provides step-by-step instructions for adjusting offsets on the Haas mill during a production run. It includes use of Haas CNC Simulators.

Haas Mill: First Part Runs

This class describes how to verify the accuracy of a program and make minor editing changes on the Haas mill. It includes use of Haas CNC Simulators.

Haas Mill: Locating Program Zero

This class describes how to determine work offsets and tool geometry offsets on the Haas mill during setup. It includes use of Haas CNC Simulators.

Haas Mill: Program Execution

This class describes the steps necessary to activate, execute and restart programs on the Haas mill. It includes use of Haas CNC Simulators.

Haas Mill: Program Storage

This class describes common methods for transferring and storing part programs on the Haas mill. It includes use of Haas CNC Simulators.

History and Definition of CNC

This class outlines the origin of today's CNC (computer-numerical-control) machines and explains how modern CNC evolved from its original designs.

Introduction to EDM

This class introduces the process, components and machines of electric discharge machining (EDM).

Mazak Lathe: Control Panel Overview

This class introduces the Mazak Mazatrol Matrix lathe control panel and describes the steps for powering up and powering down the machine.

Mazak Lathe: Entering Offsets

This class teaches various offsets of the Matrix lathe, how to view offsets using the Matrix control, and how to adjust offsets to compensate for tool wear.

Mazak Lathe: First Part Runs

This class describes how to verify the accuracy of a program and make minor editing changes on the Mazak Mazatrol Matrix Lathe control to ensure part quality.

Mazak Lathe: Locating Program Zero

This class discusses the various coordinates systems involving machine components and considerations for selecting workpiece zero.

Mazak Lathe: Program Execution

This class addresses the steps needed to start, stop and restart programs on the Mazak lathe along with steps used to activate a program.

Mazak Lathe: Program Storage

This class describes common methods for transferring and storing part programs on the Mazak Mazatrol Matrix lathe control.

Mazak Lathe: Safety for the Lathe

This class discusses common safety issues concerning the Mazak lathe, as well as OSHA and ANSI requirements for Mazak lathe operators.

Mazak Mill: Control Panel Overview

This class introduces the Mazak Mazatrol Matrix mill control panel and describes the steps for powering up and powering down the machine.

Mazak Mill: Entering Offsets

This class provides an overview of offsets and the step-by-step instructions needed for measuring, entering and adjusting offsets using the Mazak Mazatrol Matrix Mill control.

Mazak Mill: First Part Runs

This class describes how to verify the accuracy of a program and make minor editing changes on the Mazak Mazatrol Matrix Mill control to ensure part quality.

Mazak Mill: Locating Program Zero

This class discusses the various coordinates systems involving machine components and considerations for selecting workpiece zero.

Mazak Mill: Program Execution

This class addresses the steps necessary to start, stop and restart programs on the Mazak mill along with steps used to activate a program.

Mazak Mill: Program Storage

This class describes common methods for transferring and storing part programs on the Mazak Mazatrol Matrix mill control.

Mazak Mill: Safety for the Mill

This class discusses common safety issues concerning the Mazak mill, as well as OSHA and ANSI requirements for Mazak mill operators.

Mechanics of CNC

This class describes the mechanical systems involved in CNC axis movement, as well as how feedback is used for tool location.

Milling Calculations

This class explains the common calculations necessary to plot toolpaths for a basic milling program.

Part Program

This class introduces the major code groups used in a CNC part program. It includes an interactive lab.

Turning Calculations

This class explains the common calculations necessary to plot toolpaths for a basic turning program.

COATINGS

Coating Defects

This class covers the common types of coating defects, as well as their related causes and prevention techniques.

Introduction to Coating Composition

This class discusses key components of a coating, as well as environmental risks that solvents pose and alternatives to using solvent as a carrier for coatings.

Processes for Applying Coatings

This class covers the processes used to apply coatings to a variety of surfaces. It includes descriptions of manual coating automated coating electroplating and powder coating.

Surface Preparation for Coatings

This class covers various options for preparing surfaces before the application of a coating. The class also addresses the nature of common surfaces.

Troubleshooting Coating Defects

This class covers the basics of troubleshooting coating processes. It includes descriptions of various tools used in the troubleshooting process, including Pareto charts, check sheets and fishbone diagrams.

COMPOSITES

Advanced Materials for Composites

This class covers the thermoplastic and non-polymeric resins used to create advanced composite parts, as well as the materials used to create high-performance fiber reinforcements.

Advanced Thermoset Resins for Composites

This class covers the thermoset resins commonly used to create advanced composite parts, as well as their properties and general considerations for material selection.

Composite Inspection and Defect Prevention

This class describes common methods for inspecting composites and preventing defects.

Composite Structures: Fabrication and Damage Repair - Phase 1

The Fabrication & Damage Repair - Phase 1 course is designed to meet the needs of a wide range of personnel from the very beginner to the seasoned professional. The Phase 1 course is highly recommended to anyone who seeks a better understanding of advanced composites.

Composites Structures: Fabrication and Damage Repair - Phase 2

The Phase 2 course is designed as a direct follow-on to our Phase 1 course for repair technicians, mechanics, supervisors and quality assurance personnel directly involved in providing high performance repairs to advanced composite structures.

Composite Structures: Fabrication and Damage Repair - Phase 3

Designed for the repair technician, lead, or supervisor who wants to further his or her education pertaining to repairs of composite structures, this class presents more challenging damage assessment and repair situations than those presented in our Phase 2 class.

Introduction to Composites

This class covers the basic materials used to make composites, how composites are processed and the applications of composites in various markets.

Introduction to Compression Molding

This class teaches the compression molding process, as well as the materials and equipment associated with it.

Introduction to Lay-up and Spray-up Molding

This class covers lay-up and spray-up molding of traditional fiberglass composites.

Overview of Composite Processes

This class covers the basic methods for processing composites, as well as some of the materials used in these processes.

Repair Methods for Composites

This class covers basic procedures and best practices for repairing composites, as well as the structure of composite laminates and sandwich panels.

Safety for Composite Processing

This class teaches operators how to protect themselves from illness and injury when working with composites. It also covers how to store and discard hazardous materials. Finally, it also details the agencies that develop and regulate workplace safety standards.

Surface Finishing Composites

Understanding how to finish the surface of a composite part helps an operator create parts that meet the demands of the customer. This class teaches about surface finishing operations for composite parts.

Traditional Composites

This class covers the materials commonly used to create resins and reinforcements for traditional composites. It also describes the basic characteristics of polymers.

Vacuum Bagging Technique: Single-Sided Bagging

This class covers basic procedures for performing single-sided vacuum bagging. It also covers general safety precautions and strategies that prevent common problems.

ELECTRICAL

AC Fundamentals

This class introduces the concept of alternating current (AC) and describes variables that measure AC power.

AC Power Sources

This course introduces various means by which AC power is produced and used. It also covers AC's advantages over DC and power transformation. It includes an interactive lab.

Battery Selection

This class discusses the factors on which batteries are rated and describes many of the most common battery types. It includes an interactive lab.

Conductor Selection

This course describes different conductor and insulation types and explains proper wire sizing according to NEC standards and calculations. It includes an interactive lab.

DC Circuit Components

This class explains the function and purpose of various components used in DC circuits.

DC Power Sources

This course, which introduces various means by which DC power is created and used, covers DC power generation and the limits of its applications. It includes an interactive lab.

Electrical Instruments

An overview of the various meters used in electrical maintenance. Basic principles, proper use and safety procedures are discussed.

Electrical Print Reading

This class explains the basic principles of reading electrical prints with an emphasis on schematic symbols. Includes an interactive lab.

Electrical Units

This class describes how electricity flows and explains the basic units used to measure electricity.

Introduction to Circuits

This class describes the basic components of an electrical circuit and explains how they are represented in schematic drawings. It includes an interactive lab.

Introduction to Magnetism

This class covers the fundamental principles of magnetism and explains its relationship to electricity.

NEC Overview

This class introduces the NEC Codebook and explains how it is used by electrical workers. It includes an interactive lab.

Parallel Circuit Calculations

This class introduces the rules and formulas for parallel circuit calculations.

Safety for Electrical Work

This class describes safety risks associated with electricity. It covers necessary precautions for working safely with electricity. It includes an interactive lab.

Series Circuit Calculations

This class covers the formulas and rules for calculating the values of voltage, current resistance and power in direct-current series circuits.

FASTENERS

Introduction to Assembly

This class describes the common assembly methods of mechanical fastening, adhesive bonding and welding.

Introduction to Fastener Ergonomics

This class introduces ergonomics and discusses the ergonomic concerns associated with assembly.

Introduction to Fastener Threads

This class describes fastener threads and their characteristics and explains different thread standards and classifications.

Overview of Non-Threaded Fasteners

This class summarizes the various types of non-threaded fasteners used in assemblies and describes their common applications.

Overview of Threaded Fasteners

This class summarizes the various types of threaded fasteners used in assemblies and describes their common applications.

Properties for Fasteners

This class describes the key properties of steel fasteners, as well as common fastener failures that may occur.

Safety for Assembly

This class introduces general safety guidelines for assembly.

Threaded Fastener Selection

This class describes how to select a threaded fastener, as well as how to install a bolt and nut combination into a joint.

Tools for Threaded Fasteners

This class outlines the different types of tools for assembly commonly used with threaded fasteners.

Understanding Torque

This class explains the importance of torque, as well as how torque is derived and applied to bolted joints. It includes an interactive lab.

HYDRAULICS & PNEUMATICS

Actuator Applications

This class provides an overview of actuators for fluid power systems, including cylinders, rotary actuators and fluid motors. It includes an interactive lab.

Basic Hydraulic System Design

This class provides an overview of basic hydraulic circuits and how they are designed to perform basic tasks.

Basic Pneumatic Circuit Design

This class provides an overview of basic pneumatic circuits and how they are designed to perform basic tasks.

Contamination and Filter Selection

This class provides an overview of contamination hydraulic filters and fluid maintenance. It includes an interactive lab.

Fittings for Fluid Systems

This class provides an overview of fittings for fluid power systems, including pipe fittings, tube fittings, hose fittings and the seals that make them work.

Fluid System Print Reading

This class describes the basic layout of hydraulic and pneumatic prints and addresses the most common symbols used to identify components.

The Forces of Fluid Power

This class provides an introduction to the forces of fluid power, including force multiplication, work, energy and power.

Hydraulic Control Valves

This class surveys the most common types of hydraulic control valves and explains how each type functions within a hydraulic system. It includes an interactive lab.

Hydraulic Fluid Selection

This class provides an overview of the types of hydraulic fluid and the properties that make them ideal for certain applications. It includes an interactive lab.

Hydraulic Power Sources

This class discusses various types of hydraulic pumps and how they create fluid flow. It also describes prime movers and the considerations for selecting a pump and motor unit for a specific application.

Hydraulic Power Variables

This class discusses variables involved in hydraulic power transmission and how they describe the capabilities of a hydraulic system. It includes an interactive lab.

Hydraulic Principles and System Design

This class provides an overview of common mathematical calculations used to size fluid components in the design phase of circuit creation. It includes an interactive lab.

Introduction to Fluid Conductors

This class provides an overview of fluid power conductors, including pipe, tubing, hose and manifolds.

Introduction to Fluid Systems

This class provides an introduction to fluid power systems, including hydraulic and pneumatic components.

Introduction to Hydraulic Components

This class presents an overview of basic hydraulic system components. It includes an interactive lab.

Introduction to Pneumatic Components

This class presents an overview of basic pneumatic system components.

Pneumatic Control Valves

This class surveys the most common types of pneumatic control valves and explains how each type functions within a pneumatic system.

Pneumatic Power Sources

This class describes different types of compressors and how they generate gas flow. It also describes prime movers and primary factors to consider when selecting a compressor for a particular application.

Pneumatic Power Variables

This class discusses the variables involved in pneumatic power transmission and how they describe the capabilities of a pneumatic system.

Preventive Maintenance for Fluid Systems

This class provides an introduction to preventive maintenance for hydraulic and pneumatic fluid systems.

Safety for Hydraulics and Pneumatics

This class addresses safe work practices for hydraulics and pneumatics and includes information on preventive measures for safety hazards in the manufacturing workplace. It includes an interactive lab.

INSPECTION

Basic Measurement

This class introduces the basic measuring devices used in the shop to ensure part quality. It includes an interactive lab.

Basics of the CMM

This class identifies the major types and components of the CMM (coordinate measurement machine) and describes the coordinate system.

Basics of the Optical Comparator

This class explains the principles of optical inspection and describes the components of the optical comparator.

Geometric Dimensioning & Tolerancing Fundamentals

The class covers the fundamentals of what you need to know to function and work as a professional in an organization that uses the geometric tolerancing system. It consists of lectures and exercises based on application and interpretation of the system. Models are used to make illustrations and allow attendees to have a hands-on interaction (Metric and Inches).

Hardness Testing

This class provides an overview of the most common hardness testing methods and describes how to read hardness ratings.

Hole Inspection

This class explains different hole characteristics and describes how specific gages are used for different hole inspection applications. It includes an interactive lab.

Inspecting with CMMs

This class compares the advantages and common uses of various CMM components and software applications.

Inspecting with Optical Comparators

This class compares different types of optical comparators and explains how they work best under different conditions.

Interpreting GD&T

This class explains important rules of geometric dimensioning and tolerancing (GD&T) and also describes how common features are specified in GD&T prints. It includes an interactive lab.

Introduction to GD&T

This class introduces the fundamental concepts of geometric dimensioning and tolerancing (GD&T) and describes the main types of tolerances included in the standard. It includes an interactive lab.

Linear Instrument Characteristics

This class describes the various characteristics of linear measuring instruments and explains how variation affects the inspection process. It includes an interactive lab.

Measuring System Analysis

This class explains the purpose and methods of measuring systems analysis, including measurement variation, gage repeatability, and reproducibility studies.

Overview of Threads

This class describes the various parts of a screw thread, common thread standards and tolerances, and the various tools used to inspect them.

Surface Measurement

This class identifies the different types of surface texture and describes how the surface texture of a part affects its use.

Thread Inspection

This class provides suggestions and how-to information for inspecting threads with a range of common instruments and gages. It includes an interactive lab.

MACHINIST TECHNOLOGY/CNC

IT Fundamentals of Computers

This course is an introduction to computers and the fundamentals of operating systems and software programs. It provides hands-on experience with computer applications, including word processing, spreadsheets, e-mail and the Internet.

Interpersonal Communication

This course provides instruction in interpersonal skills to communicate effectively in the workplace. It helps build and enhance communication skills through active listening, verbal and nonverbal communication, managing conflict, critical thinking, understanding diversity and the effects of culture, as well as how the imbalance of power can lead to difficulties in the workplace.

MAT Mathematics for Machinist Technology

This course is designed to develop an understanding of mathematical concepts required of skilled employees in the machining trade and related occupations.

MFE Computer-Aided-Design (CAD)

This course provides a solid foundation in reading and creating engineering drawings (blueprints) to recognized ANSI (American National Standards Institute) standards. Drawing standards multi-view, section and auxiliary views, dimensioning, and geometric dimensioning and tolerancing (GD&T) are at the heart of blueprint reading. Students learn 2D CAD techniques to produce engineering drawings of manufactured components to ANSI standards.

MT Blueprint Reading

This course develops the ability to read standard and GDT orthographic blueprints as required in a machine shop.

MT CNC Set up/Operation

This course provides comprehensive instruction on CNC mill and lathe operations, including machine setup and tooling selection. It includes instruction on work coordinates, tool length offsets, coordinate settings, program entering and editing, tool wear compensation, setting zero, and part set up. Mill operations cover X, Y and Z axes; lathe operations cover X and Z axes.

MT Computer-Aided-Manufacturing

This course introduces CNC Programming via CAD/CAM. It covers CAD/CAM software, conversational programming, basic part drawing, process layout, tool selection, and how to post a program. Students also receive instruction in program verification and analysis. The focus is on 2- and 3-axis programming.

MT Industrial Safety

An introductory course designed to develop safe workplace practices and become familiar with OSHA standards. Students will be required to demonstrate safe handling of work materials, operation machines, tooling, and storage and disposal of hazardous materials.

MT Introduction to CNC Machining

This course provides an overview of the history of CNC machining, as well as the operation, setup, G-code programming and coordinate systems used in CNC machines. It offers hands-on experience with up-to-date CNC equipment after learning the basics of machine programming and operation.

MT Introduction to Machinery

This course consists of hands-on laboratory experience to acquaint students with machinery and the industrial environment. The application of skills and knowledge of machine tool processes are stressed. (Prerequisite of instructor permission is necessary.)

MT Machine Safety

An introductory course designed to develop safe workplace practices and become familiar with OSHA standards. Students are required to demonstrate safe handling of work materials and operation of machines and tooling, as well as storage and disposal of hazardous materials.

MT Metalworking Theory and Application

During this course, students become skilled in the use of machines and processes used in metalworking.

MT NIMS Credentialing/CNC Project

Students are required to pass the two NIMS CNC Machining Level tests, both written and performance. Students are required to produce parts from drawings on a project basis to ensure competency in all aspects of CNC operation and programming.

MT NIMS Credentialing

This course acquaints students with the National Institute for Metalworking Skills (NIMS) and prepares them to earn individual, portable, national credentials recognized by NIMS.

MT Precision Measurement

This course is designed to identify, select and use measurement instruments in machining. It includes an introduction to the metric system of measurement.

Technical Report Writing

A course designed for individuals who need to prepare written technical reports. Its emphasis is on solid writing principles and the use of supplementary illustrations as they apply to technical reports.

MANUAL MACHINING

Basics of the Engine Lathe

This class describes the basic parts of the engine lathe, as well as the cutting tools and workholding devices used on a typical lathe.

Basics of the Manual Mill

This class describes the basic components of the manual mill and also covers common workholding devices, cutting tools and toolholders used on the mill.

Benchwork and Layout Operations

This class describes common benchwork operations performed on the mill before and after machining a part, and covers common layout tools and procedures.

Engine Lathe Operation

This class guides you through the machining of a cylindrical part using inner- and outer-diameter cutting operations, as well as explains general principles of each operation.

Holemaking on the Mill

This class describes how to perform common holemaking operations on the manual mill and explains common principles about each holemaking process.

Manual Mill Operation

This class guides you through the machining of a common part on the mill, as well as explains common operations performed on the mill.

Overview of Engine Lathe Setup

This class describes the proper setup for a typical lathe operation and explains how to align, adjust and select the components on the lathe.

Overview of Manual Mill Setup

This class describes the proper setup for a typical mill operation and explains how to determine mill settings, align mill components and select proper tooling.

Taper Turning on the Engine Lathe

This introductory class covers methods of turning basic tapered parts on an engine lathe.

Threading on the Engine Lathe

This class describes the manual lathe components used for threading and explains how to cut and inspect an external and internal thread.

MATERIALS

Ceramics

This class identifies the major categories, properties and uses of ceramics.

Ferrous Metals and Alloys

This class identifies the major categories, properties and uses of steels and their alloys.

Heat Treatment of Steel

This class describes different steel phases, as well as common heat treatment methods for steel. It includes an interactive lab.

Introduction to Additive Manufacturing (AM)

This class provides an introduction to Additive Manufacturing (AM) technology, which involves use of a 3D Printer. The overview advances the uses and applications of this leading edge technology.

Introduction to Materials

This class identifies the major categories of materials used in manufacturing and compares their general properties.

Mechanical Properties of Metals

This class describes common mechanical properties of metals and explains the stress-strain curve. It includes an interactive lab.

Metal Classification

This class introduces the AISI-SAE classification for steels.

Metal Manufacturing

This class covers the steps used to produce commercial steel from its original ore.

Nonferrous Metals and Alloys

This class identifies the major categories, properties and uses of nonferrous metals and their alloys.

Overview of Plastic Materials

This class describes different types of plastics and their characteristics.

Overview of Plastic Processes

This class describes the most common plastic manufacturing processes and the machinery used to manufacture plastic components.

Overview of Properties for Plastics

This class describes the mechanical and chemical properties of plastics and addresses how they impact design considerations.

Physical Properties of Metals

This class introduces the physical properties of metals and explains how these properties determine potential applications.

Plastics

This class identifies the major categories, properties and uses of plastics.

Principles of Injection Molding

This class will familiarize students with injection molding and the design concerns associated with injection molding.

Principles of Thermoforming

This class describes the thermoforming process and explains the different variations of thermoforming, including pressure forming and vacuum forming.

Structure of Metals

This class describes the atomic structure of metals and explains how this structure affects each metal's properties.

MECHANICAL SYSTEMS

Bearing Applications

This class describes different types of bearings, the operating conditions in which they are used, and important considerations for proper installation and maintenance of the major types of bearings available. It includes an interactive lab.

Belt Drive Applications

This class explains how belt drive systems are used to transmit power and discusses various types of belts used in industry.

Clutch and Brake Applications

This class describes different types of clutches and brakes, the operating conditions in which they are used, and covers installation, maintenance and safety concerns.

Forces of Machines

This class identifies the various types of mechanical forces and describes how these forces act on objects. It includes an interactive lab.

Gear Applications

This class discusses various types of gears used in industry, including information on how gears are used, maintained and classified.

Gear Geometry

This class discusses the geometry and design of gears commonly used in industry. It includes an interactive lab.

Introduction to Mechanical Systems

This class examines simple machines, such as the lever and inclined plane, and covers basic concepts of physical science, including mechanical advantage and friction.

Lubricant Fundamentals

This class describes different types of industrial lubricants and explains the importance of proper lubrication procedure. It includes an interactive lab.

Mechanical Power Variables

This class discusses variables involved in mechanical power transmission and how they affect industrial processes. It includes an interactive lab.

Power Transmission Components

This class discusses the process of mechanical power transmission and describes the components used to transmit mechanical energy.

Safety for Mechanical Work

This class describes safety precautions for performing maintenance on mechanical systems.

Spring Applications

This class discusses different types of springs, how they are used in machines and how to select the right spring for a particular application.

METAL CUTTING

ANSI Insert Selection

This class walks through the ANSI B212.4-1995 standard for insert identification.

Band Saw Blade Selection

This class compares the various types of band saw blades and identifies factors that influence blade selection.

Carbide Grade Selection

This class describes the common forms of carbide available in cutting tools.

Cutting Fluids

This class identifies major cutting fluids and their common uses.

Cutting Processes

This class provides a comprehensive overview of the most common metal cutting operations performed in the shop. It includes an interactive lab.

Cutting Tool Materials

This class describes common cutting tool materials and their typical applications.

Cutting Variables

This class describes some of the variables that impact common machining operations. It includes an interactive lab.

Drill Geometry

This class identifies the major drill components and angles that impact drilling operations. It includes an interactive lab.

Hard Turning

This class covers hard turning. It covers its advantages when compared to grinding and strategies for successful implementation.

High-Speed Machining

This class compares high-speed machining (HSM) to traditional machining and explains the key factors that impact its successful application.

Introduction to Screw Machining

This class identifies the common components and operations of the screw machine and compares common screw machine designs.

Machines for Metal Cutting

This class identifies and describes the common machines used in metal cutting.

Machining Titanium Alloys

This class identifies and addresses the challenges related to machining titanium and its alloys.

Metal Removal Processes

This class describes traditional machining processes, such as metal cutting and grinding, as well as various nontraditional methods of machining.

Milling Geometry

This class identifies and explains the face mill and end mill tool angles that impact a milling operation. It includes an interactive lab.

Optimizing Insert Life

This class describes common forms of insert wear that lead to insert failure and identifies appropriate control methods for each type. It includes an interactive lab.

Safety for Metal Cutting

This class identifies safety hazards associated with cutting operations and the precautions you must take to avoid injury.

Sawing Fundamentals

This class identifies the main types of sawing and introduces basic terminology for saw blade types and materials.

Speed and Feed Selection

This class identifies the various speed and feed values used with the lathe and mill and describes how to convert these variables. It includes an interactive lab.

Tool Geometry

This class identifies the major tool angles that impact the turning operation. It includes an interactive lab.

Toolholders for Turning

This class explains the components and identification of OD and ID toolholders used on the lathe.

What is Cutting?

This class addresses the theory of proper chip formation during the machining process. It includes an interactive lab.

MOTOR CONTROLS

AC Motor Applications

This class describes the common parts of AC motors, as well as different motor types and covers their applications, maintenance and troubleshooting concerns.

Acceleration Methods

This class describes factors involved with motor acceleration and how they relate to each other. It also explains how speed and acceleration are controlled in various types of electric motors.

Contactors and Motor Starters

This class provides information on the basic design and function of contactors and motor starters. It includes an interactive lab.

Control Devices

This class describes various types of control devices, their parts and how control devices are used in different applications. It includes an interactive lab.

DC Motor Applications

This class focuses on DC motors, their main parts, and how they are used and maintained. It includes an interactive lab.

Deceleration Methods

This class describes various methods used to cause motor deceleration. It explains situations in which braking is needed and shows how braking is accomplished.

Distribution Systems

This class describes the means of distributing power to motors and other electrical devices in a typical industrial shop, focusing on distribution systems.

Electronic Semiconductor Devices

This class covers functions and characteristics of many different electronic semiconductor devices.

Introduction to Electric Motors

This class discusses how various types of electric motors are applied throughout industry and the principles behind motor operation. It includes an interactive lab.

Limit Switches and Proximity Sensors

This class covers properties and functions of limit switches and inductive and capacitive proximity sensors, as well as hall effect sensors. It includes an interactive lab.

Logic and Line Diagrams

This class covers the basic rules for line diagrams and their common elements. It also describes how line diagrams are put together and how they are referenced.

Photoelectric and Ultrasonic Devices

This class covers the properties and functions of photoelectric and ultrasonic sensors. It includes an interactive lab.

Photonic Semiconductor Devices

This class covers characteristics and functions of photonic semiconductor devices.

Reduced Voltage Starting

This class describes various methods of reduced voltage starting and explains when each type of starter is used.

Reversing Motor Circuits

This class describes the proper ways to design reversing motor control circuits for many types of electric motors using different types of starters and switches.

Solenoids

This class describes principles behind solenoid operation, lists the main types of solenoids, and explains their function and application. It includes an interactive lab.

Solid-State Relays and Starters

This class covers characteristics and functions of solid state relays and motor starters. It includes an interactive lab.

Specifications for Servomotors

This class covers the basic types of servomotors and components that can be used in a servo system.

Symbols and Diagrams for Motors

This class describes common types of motor control symbols found in most schematic diagrams, as well as their function in a motor application.

Timers and Counters

This class describes the functions and applications of various mechanical, electromechanical, and electronic timers and counters. It includes an interactive lab.

PLCs

Basic PLC Programming

This class covers the basics of PLC (programmable logic controllers) programming using ladder logic. It identifies common PLC commands and describe how these commands can be used to program a controller.

Basics of Ladder Logic

This class describes basic principles of ladder logic, identifies the symbols used to program a PLC and explains the primary logic functions that these symbols create. It includes an interactive lab.

Data Manipulation

This class explains basic data moving functions and describes how and why these functions are used.

Hand-Held Programmers of PLCs

This class covers the basic functions and characteristics of hand-held programmers. It includes an interactive lab.

Hardware for PLCs

This class covers characteristics and functions of different types of PLC hardware and provides basic troubleshooting procedures and maintenance tips. It includes an interactive lab.

Introduction to PLCs

This class introduces the parts and operations of programmable logic controllers (PLCs) and describes the functions and different programming languages used on most PLCs. It includes an interactive lab.

Math for PLCs

This class covers common mathematical functions for PLCs, as well as the integer and decimal values and numeric codes involved in PLC math calculations.

Networking for PLCs

This class covers basic principles of PLC networking and provides an introduction to some common industrial networks. It includes an interactive lab.

Numbering Systems and Codes

This class explains how to convert between binary, decimal, octal and hexadecimal number systems and describes how these systems are used to convey information for PLCs.

Overview of PLC Registers

This class introduces how digital signals are converted into binary data and how this data is stored in various types of registers.

PID for PLCs

This class covers the effects of a proportional integral derivative (PID) controller in closed-loop systems, as well as methods for tuning your controller to achieve the desired performance.

PLC Diagrams and Programs

This class details how to convert line diagrams and wiring diagrams for use with PLCs.

PLC Inputs and Outputs

This class covers different types, configurations, capacities and current conversions for PLC Inputs/Outputs (I/Os). It includes an interactive lab.

PLC Installation Practices

This class covers the proper steps for planning and installing a basic PLC system. It includes an interactive lab.

PLC Program Control Instructions

This class covers some of the most common program control instructions for PLCs. It includes an interactive lab.

PLC Timers and Counters

This class explains how different types of PLC timers and counters work.

Sequencer Instructions for PLCs

This class covers sequencer instructions for PLCs.

Shift Registers

This class explains various register shifts that can be used in a PLC.

PRESS BRAKES

Bending Fundamentals

This class describes key factors that affect a bending operation on the press brake and also surveys common types of forming and bending operations. It includes an interactive lab.

Die Bending Operations

This class describes different types of bends that can be formed on the press brake.

Operating the Press Brake

This class describes how to operate a press brake and also covers the different modes of operation and controls used when operating a press brake.

Press Brake Components

This class identifies the major components of the press brake and describes the most common press brake designs. It includes an interactive lab.

Press Brake Safety

This class provides an overview of safety procedures when operating a press brake, including a description of how to adjust pullback cables.

Press Brake Specifications

This class identifies common specifications of press brakes and describes various features and options available for common machines. It includes an interactive lab.

PROFESSIONAL DEVELOPMENT

The ABCs of Supervising Others

This workshop is for new supervisors or those who are interested in a supervisory position, as well as those who are lead hands or part-time supervisors without a great deal of authority. It is designed to help overcome many of the supervisory problems often encountered in the first few weeks as a boss.

Basics of Manufacturing Costs

This class describes the basic costs associated with manufacturing and how these costs are typically controlled.

Behavioral Interviewing Techniques

Behavior Interviewing is a reliable and valid candidate selection technique based on the work of Tom Janz of the University of Calgary. This two-day workshop concentrates on the pre-interview preparation, developing questions and their value, the interview techniques that get specific, behavior-based examples of past performance, as well as strategies that follow through on this process.

Budgets and Managing Money

This two-day workshop presents the key concepts of finance and accounting to help prepare budgets and make decisions with more confidence.

Building Better Teams

Whether the focus is on service, quality, cost, value, speed, efficiency, performance, or other goals, teams are the central method used by most organizations. Your success as an organization can depend on how well you and your team members operate together.

Building Relationships for Success in Sales

In this one-day workshop you are going to discover that the business of business is making friends, and the business of all sales professionals is making friends and building strategic relationships.

Building Your Self Esteem and Assertiveness Skills

During this one-day workshop you will learn how to turn around the destructive cycle of low self-esteem and self-doubt.

Business Etiquette: Gaining That Extra Edge

If you want to enhance and polish your business image or if you just want to avoid feeling uncomfortable in the corporate world, this workshop will allow you to take a quantum leap forward in skill sophistication and confidence.

Business Leadership: Becoming Management Material

This three-day workshop is a tool for your leadership development designed to help you create and accomplish your personal best and lead others to get extraordinary things done.

Business Writing that Works

This two-day workshop will concentrate on the nitty-gritty details that writers have to contend with, including a discussion of writing problems and solutions, and a chance to gain practical advice on making the job less difficult.

Change and How to Deal with It

This one-day workshop helps managers deal with change and offers practical strategies to share with your employees.

Coaching: A Leadership Skill

This one-day workshop will help you become a better coach using skills that range from Role Model and Counselor to Supporter and Guide.

Communication Strategies

A major goal of this two-day workshop is to help you understand the impact that your communication skills have on other people and how improving these skills can make it easier for you to get along in the workplace.

Conducting Effective Performance Reviews

Setting goals and objectives to aim for gives supervisors and employees a unified focus and targets to aim for. Supervisors must also learn how to give regular and timely feedback, both positive and negative, so employees can grow and develop.

Conflict Resolution for Different Groups

This class describes a variety of situations in which a conflict may occur and offers advice for the best approaches to dealing with these conflicts. It includes an interactive lab.

Conflict Resolution Principles

This class covers the basic steps that a manager can take to resolve conflicts in the workplace and help ensure that the same conflicts do not return. It includes an interactive lab.

Conflict Resolution: Dealing with Difficult People

Because success sometimes depends on your ability to work well with many different personality types, including difficult ones, this course gives tips and techniques for dealing with difficult people in the workplace.

Conflict Resolution: Getting Along in the Workplace

All of us experience conflict. Since you can't prevent conflict, the important thing is to learn how to handle or manage it. Doing so requires openness, discipline and creativity. There are several strategies for coping with conflict. Knowing when and how to use them can make you a more effective leader.

Customer Service Training - Critical Elements of Customer Service

This one-day workshop is for any employee who deals with the public or serves those who deal with the public. Customer service skills can increase your value to your company and advance your career at the same time.

Customer Service Training: Managing Customer Service

This one-day workshop provides you with an opportunity to explore your responsibilities in your role as a customer service agent.

Diversity Training: Celebrating Diversity in the Workplace

This one-day workshop focuses on how you as an individual can celebrate the diversity of your colleagues' gender, sexual orientation, religion and ethnic background so your workplace can come together as a team and become a more diverse environment.

Dynamite Sales Presentations

This one-day workshop focuses on your formal written sales proposal and in-person presentation to help you impress your clients with your knowledge of the products and services you sell and your understanding of your clients' problems and the solutions they need.

Employee Dispute Resolution: Mediation through Peer Review

Have you ever been in a situation where a supervisor has made a decision that you don't agree with? Did you wish that you could ask someone else what they thought of the decision? The Peer Review process offers employees this chance.

Essentials of Communication

This class describes key types of communication and common roadblocks to communication, as well as how to use effective communication as a tool to help build teamwork and manage conflict. It includes an interactive lab.

Essentials of Leadership

This class describes the basic responsibilities of a leader and gives helpful ideas about how to gain the respect and trust of others. It includes an interactive lab.

Facilitation Skills

This course deals with up-to-date training techniques, including lecturettees, group discussions, case studies, problem solving exercises and visual aids. Participants' handbooks will note key points, accommodate handouts and provide space for individual learning.

Harassment and Discrimination

This class describes the issues surrounding diversity in the modern workplace, as well as describes some employer responsibilities in regard to diversity management. It includes an interactive lab.

Human Resources Training For the Non-HR Manager

This three-day workshop introduces managers to human resource concepts. It takes you through the hiring process from performing a skills inventory to conducting the interview and covers orientation and other issues that arise after the hiring.

ISM Principles of Supervision & Management

This class presents fundamental principles of administrative staff and operating management with organizational structures, operative procedures, and systems emphasized. Principles include responsibilities duties and relationships of supervisors and leaders.

IT Fundamentals of Computers

This course is an introduction to computers and the fundamentals of operating systems and software programs. It provides hands-on experience with computer applications, including word processing, spreadsheets, e-mail and the Internet.

Interpersonal Communication

This course provides instruction in interpersonal skills to communicate effectively in the workplace. It helps build and enhance communication skills through active listening, verbal and nonverbal communication, managing conflict, critical thinking, understanding diversity and the effects of culture, as well as how the imbalance of power can lead to difficulties in the workplace.

Introduction to Managerial Accounting

This class explains the basics of managerial accounting and how this information helps a manager make informed decisions.

Introduction to Social Media for Manufacturers

This class is an introduction about how to build your manufacturing business through social media.

Inventory Management: The Nuts and Bolts

This is a workshop for warehouse or stockroom managers or anyone who is in charge of what comes in and goes out in your company. The goal is a smooth and cost-effective operation with enough products on hand to satisfy needs without stockpiling too much. This course helps show you how to achieve this goal.

Managing Performance: Best Practices

This class covers the various aspects of performance management, as well as strategies for motivating employees. It includes an interactive lab.

Managing Performance: Corrective Actions

This class covers how to address employee performance issues, as well as the basic practices for employee termination. It includes an interactive lab.

Managing the Diverse Workplace

This class describes the issues surrounding diversity in the modern workplace, as well as employer responsibilities in regard to diversity management. It includes an interactive lab.

Marketing and Sales

This one-day workshop shows how to get maximum exposure at minimum cost with creative marketing tactics. Learn effective low-cost and non-cost strategies to improve sales, develop your company's image and build your bottom line.

Meeting Management: The Art of Making Meetings Work

This one-day program will be concerned with small working meetings with groups that have a job to do, requiring the energy, commitment and talents of all those who participate. This course offers tips on solving problems, setting goals/priorities and helping define mutual needs fears and hopes.

Negotiating for Results

This one-day workshop uses up-to-date training techniques and a variety of training methods, including lecturettes, group discussions, case studies, problem solving exercises and visual aids to give participants the best opportunities to learn successful negotiation. Participants' handbooks will note key points, accommodate handouts and provide space for individual learning. These workbooks will serve as a reference for individuals upon completion of this course.

Office Ethics and You: Making Good Decisions

What exactly makes a decision ethical? This workshop will help you define your ethical framework to make solving ethical dilemmas easier. It also presents tools and techniques to use when faced with an ethical decision. It also presents case studies so you can practice making decisions in a safe environment.

Orientation Handbook: Getting Employees off to a Good Start

This two-day workshop shows how to give new employees what they need to feel welcome, know why they were hired and how to do the job.

Overcoming Objections: Nailing the Sale

This workshop helps you plan, prepare and execute proposals and presentations that address customer concerns, reduce the number of objections you encounter and improve your batting average at closing the sale.

Performance Management and the Law

This class covers the basic Federal employment laws that apply to manufacturing. It includes an interactive lab.

Performance Management: Managing Employee Performance

This three-day course is for supervisors who wish to better understand themselves and others through completing and interpreting personality typing, develop their problem solving and decision making skills, and explore performance management issues.

Personal Finance

Personal Finance is designed to assist students in the management of their personal financial affairs. It provides detailed coverage in the areas of money management, career planning, taxes, consumer credit, housing and other consumer decisions, legal protection, insurance investments, retirement planning, and estate planning. It presents the fundamentals of financial planning related to spending, saving, borrowing and investing that lead to long-term financial security.

Problem Solving and Decision Making

If you are tired of applying dead-end solutions to recurring problems in your company, this two-day workshop should help you reconstruct your efforts and learn new ways to approach problem-solving and develop practical ways to solve some of your most pressing problems and reach win-win decisions.

Prospecting for Leads Like a Pro

Prospecting is the key to your sales success. Your success today is a result of the prospecting you did six months ago. In this one-day workshop you will become skilled at networking and learn the 80/20 rule. After the workshop you will know who to target and how to target them and remember to conduct prospecting every day. You will also build your personal prospecting plan to ensure your future by planting seeds daily.

Public Speaking: Presentation Survival School

A great presenter has two unique qualities appropriate skills and personal confidence. This confidence comes from knowing what you want to say and being comfortable with your communication skills. In this two-day workshop you will master the skills that will make you a better speaker and presenter.

Selling Smarter

It's no secret that selling has changed in recent years. This one-day workshop will help you identify and develop dynamic skills such as identifying needs and persuading potential customers to respond favorably to an idea that will result in mutual satisfaction enabling you to sell smarter

Skills for the Administrative Assistant

This two-day workshop will help maximize your potential as a support person by employing positive interaction techniques and building relationships with co-workers.

Stress Management

This one-day workshop will explore the harmful long-term effects of stress on our mental and physical health and provide suggestions for managing our individual stresses more effectively.

Technical Report Writing

A course designed for individuals who need to prepare written technical reports. Its emphasis is on solid writing principles and the use of supplementary illustrations as they apply to technical reports.

Team Leadership

This class teaches the basics of effectively leading a team, including picking team members and resolving conflicts. It includes an interactive lab.

QUALITY

5S Overview

This class provides an introduction to the 5S quality system and describes techniques for implementing 5S.

Administrative Lean

Lean Manufacturing requires a relentless pursuit to drive non-value-added activities from the overall system that constitutes the business. Therefore to be truly effective, lean has to be applied to all processes, non-production as well as production. This eight-hour workshop reviews the eight basic wastes in the context of non-production processes.

Approaches to Maintenance

This class provides an introduction to the maintenance profession and describes various approaches to the practice of maintenance.

Approaches to Quality Management

This class discusses the concept of total quality, as well as methods of implementing and measuring TQM within a company's structure.

AS9100 Internal Auditor Training

This course provides participants with the necessary skills to conduct an effective internal audit. AS9100 recommends the use of a process approach (i.e. plan, do, check, act) when implementing the clauses of the Aerospace Management System Standard. This same method and the links between the clauses, including customer contractual requirements, are used in developing audit trails and conducting internal audits that yield the most value to the organization.

AS9100 Review of Requirements

This course provides an understanding of the International Aerospace Quality Group (IAQG)-developed AS9100 Quality Management Systems - Requirements for Aviation, Space and Defense Organizations. The purpose of this standard is to ensure that global aviation space and defense organizations produce safe, reliable products that meet or exceed customer and applicable statutory and regulatory requirements, thereby improving quality and reducing costs throughout the supply chain.

Cell Design and Pull Systems

This class covers the basics of cellular manufacturing, including the characteristics of cells and pull systems. It includes an interactive lab.

Conducting an Internal Audit

This class describes the steps of the internal auditing process and explains effective approaches for conducting audit interviews.

Conducting Kaizen Events

This class describes the sequence of steps for conducting Kaizen events and explains common areas for process improvement.

Incident Investigation Training with Root Cause Analysis, Problem-solving and Corrective Action

The two-day course enables organizations to implement effective Incident Investigation programs. Provided with case studies of incidents that have Environmental Health & Safety (EH&S) and quality impacts, students use interviewing skills and problem-solving tools to identify root cause and propose effective solutions. Tools covered include 5 Whys, Is/Is Not Database, Process Flow Diagram, Cause and Effect Diagram, Histogram, Pareto Diagram, Parts Analysis, and Failure Mode and Effects Analysis.

Internal Auditor Training for Quality & Environmental Management

This course provides the skills necessary to conduct an effective process- based internal audit. Both ISO 9001 and ISO 14001 recommend the use of a process approach (i.e. plan, do, check and act) in implementing Quality and Environmental Management System Standards. This same method and the links between the clauses are used in developing audit trails and conducting internal audits that yield the most value to the organization.

Introduction to Six Sigma

This class covers the basic concepts of Six Sigma, including data analysis, types of variation, common and special causes, the roles of Six Sigma team members, and the DMAIC (Define Measure Analyze Improve and Control) process.

Introduction to Supply Chain Management

This class describes the flow of products and information in a supply chain and explains the importance of customer service.

ISO 14001 Environmental Management System Overview

This course begins with an overview on the background and development of the ISO 14001 Environmental Management System Standard. It then presents an in-depth review of the requirements of the ISO 14001 Standard, including benefits of implementing an Environmental Management System. Guidance is provided on identifying environmental aspects and impacts and setting objectives and targets.

ISO 14001 Internal Auditor Training

This course provides the skills necessary to conduct an effective internal audit. ISO 14001 recommends the use of a process approach (i.e. plan, do, check, act) when implementing the clauses of the Environmental Management System Standard. This same method and the links between the clauses are used in developing audit trails and conducting internal audits that yield the most value to the organization. The course begins by defining auditing and its purpose and objectives.

ISO 9000 Overview

This class identifies and describes the key components of the ISO 9000: 2000 standard.

ISO 9001 Internal Auditor Training

This course provides the skills necessary to conduct an effective internal audit. ISO 9001 recommends the use of a process approach (i.e. plan, do, check, act) when implementing the clauses of the Quality Management System Standard. This same method and the links between the clauses are used in developing audit trails and conducting internal audits that yield the most value to the organization. The course begins by defining auditing and its purpose and objectives.

ISO 9001 Review of Requirements

This course provides an understanding of the ISO 9000 series of standards; the process approach for developing, implementing and improving the effectiveness of a quality management system; and the requirements of each sub-clause within ISO 9001: 2008 Quality management systems - Requirements, including documentation requirements and requirements for records. The six- to eight-hour session is conducted in a workshop format with ample time for questions and the opportunity to share examples and experiences.

ISO/TS 16949 Internal Auditor Training

This course provides participants with the necessary skills to conduct effective internal audits. ISO/TS 16949 Quality management systems particular requirements for the application of ISO 9001 for automotive production and relevant service part organizations recommends the use of a process approach (i.e. plan, do, check, act) when implementing and improving the effectiveness of an automotive quality management system.

Lean Manufacturing & Simulation

This one-day seminar covers practices that when properly implemented can result in shorter lead time to the customer, increased productivity, less capital tied up in inventory, fewer number of quality rejects, less required floor space and other gains. A simulation that takes participants from traditional batch and queue scheduling to lean flow based on pull is conducted.

Lean Manufacturing Overview

This class describes the basic principles of lean manufacturing and compares them to traditional manufacturing approaches. It includes an interactive lab.

Managing Practices for Total Quality

This class discusses management roles and business categories for TQM processes used to implement TQM and methods of measuring TQM results.

Metrics for Lean

This class describes the most common metrics used to measure timing, error and costs and encourage continuous improvement in a lean system. It includes an interactive lab.

Process Flow Charting

This class covers the purpose and methods of flow charting, including spaghetti diagrams, process maps and value stream maps.

Quality Overview

This class identifies how each department and function of a company plays a role in producing quality products for the customer.

SPC Overview

This class describes the main concepts of statistical process control and explains how to recognize processes that are affected by special causes. It includes an interactive lab.

Six Sigma Black Belt

The Six Sigma Black Belt course is an extension of the Green Belt course. It can be taken in succession to the Green Belt course or as a stand-alone course. The course is open to anyone who has current Six Sigma experience or has a solid background in statistics and experience in modern Quality Assurance methods. The course averages 20 days (10 days for those who have achieved Green Belt certification).

Six Sigma Champion

The Six Sigma Champion is the key role to success in process development and the acceptance of culture change necessary for a winning solution. Proper project identification and selection are critical to achieving Six Sigma. RCBI's Champion course focuses on teaching deployment leaders how to identify potential projects, select the ones with the best potential for success, foresee potential project obstacles and set realistic expectations that ultimately drive financial results.

Six Sigma Goals and Tools

This class covers the Six Sigma DMAIC process improvement method and its primary goals, including the most common sub-steps and frequently used tools.

Six Sigma Green Belt

Six Sigma Green Belts are the first layer of practitioners in an organization's Six Sigma initiative. Green Belts are trained to use fundamental Six Sigma tools to improve processes in their functional areas. This focus allows the Green Belt to work on small, carefully defined Six Sigma projects, requiring less than a Black Belt's full-time commitment to Six Sigma throughout the organization.

Six Sigma Overview

Six Sigma is a systematic and fact-driven method used to eliminate process deficiencies and variation, thereby reducing cost and increasing profit. The technique is a measure of performance that strives for near-perfection in all processes. This half-day overview focuses on the DMAIC (Define, Measure, Analyze, Improve and Control) process and team skills that can significantly improve an organization's performance. It is intended for senior management considering deployment.

Strategies for Setup Reduction

This class covers different strategies for reducing setup times, including ideas for streamlining operations and tactics for pre-staging processes. It includes an interactive lab.

TS 16949: 2002 Overview

This class compares ISO 9001:2000 and TS 16949:2002 and explains how their differences affect the standard operating procedures in a quality management system.

Total Productive Maintenance Overview

This class describes the elements of Total Productive Maintenance (TPM) and explains how it helps reduce loss and waste.

Troubleshooting: Identifying Problems

This class provides an introduction to the troubleshooting process and describes basic steps for identifying problems.

Troubleshooting: Taking Corrective Actions

This class discusses ways to identify, implement and document effective solutions in the troubleshooting process.

Troubleshooting: Understanding Causes and Effects

This class provides an introduction to the process of determining problem causes and effects.

Understanding ISO 50001 for Improved Energy Management

This is a one-day introduction to ISO 50001: 2011

Energy Management Systems Requirements with guidance for use. This new Standard provides a familiar framework for managing strategies to increase energy efficiency, reduce costs and improve energy performance. ISO 50001 can be implemented in any organization regardless of size or activities. In addition, it can be easily integrated with Quality (ISO 9001) and Environmental (ISO 14001) Systems.

Understanding ISO/TS 16949

This one-day workshop provides participants with a solid understanding of the requirements of ISO/TS 16949 Quality management systems particular requirements for the application of ISO 9001 for automotive production and relevant service part organizations. In line with ISO 9001 the Technical Specification promotes a process approach for the design and development, production, installation and service of automotive products.

Value Stream Mapping: The Future State

This class introduces strategies commonly used to create a future state value stream map based on findings from a present state value stream map.

Value Stream Mapping: The Present State

This class introduces elements used to create a value stream map and covers how to create a value stream map of the present state.

RIGGING

Introduction to Machine Rigging

This class covers basic rigging equipment, calculating loads, inspecting equipment and following safety precautions.

Lifting and Moving Equipment

This class covers the different kinds of lifting devices, moving equipment and scaffolds used in rigging.

Rigging Equipment

This class covers the different kinds of equipment used in rigging, the properties of rope and chains, basic knots, hitches, and sling configurations, as well as fittings and end attachments.

Rigging Inspection and Safety

This class covers basic inspection and safety procedures for rigging equipment and lifting devices.

Rigging Mechanics

This class covers the mechanical laws involved in rigging, as well as essential practices for calculating the weight of a load and determining its center of gravity.

ROBOTICS

Applications for Robots

This class covers the most common applications of industrial robots.

Concepts of Robot Programming

This class covers the fundamental concepts required for programming industrial robots.

End Effectors

This class describes various types of end effectors and their uses. It also explains the issue of compliance and describes how to maintain end effectors.

Industrial Network Integration

This class describes common ways that networks are used for manufacturing. It also describes practical network concerns and identifies some of the technology used to make industrial networks function correctly.

Introduction to Robotics

This class covers classifications, characteristics and functions of industrial robots, as well as basic safety precautions for working with robots.

Robot Axes

This class describes the most common robot axes. It explains how to understand these axes and how they are used to control robot movement.

Robot Components

This class covers the functions and characteristics of the different components of an industrial robot.

Robot Installations

This class covers the basic steps for installing and maintaining an industrial robot.

Robot Maintenance

This class teaches the importance of maintenance, as well as the various approaches and methods used by maintenance workers to keep industrial robots performing optimally.

Robot Safety

This class covers different methods of protecting workers from industrial robot accidents.

Robot Sensors

This class describes various types of sensors that provide feedback data to robots. It also explains the categories of sensors and shows how sensors are used in industrial robotics.

Robot Troubleshooting

This class introduces the troubleshooting process and helps to identify problems and their causes. It also covers some problems specific to robots and identifies common causes and solutions.

Robotic Control Systems

This class covers basic types of control systems. It also covers the effects of PID control in closed-loop control systems and instructs how to tune your system to achieve the desired performance.

Robotic Drives, Hardware and Components

This class describes the physical components of industrial robots. It also describes how these devices move and cause motion to perform work.

Vision Systems

This class describes how vision systems work and how they are used for industry. It also describes concerns with mounting cameras and lighting.

SAFETY

Bloodborne Pathogens

This class addresses how bloodborne pathogens are transmitted and includes information on preventive measures and procedures for exposure in the manufacturing workplace.

Confined Spaces

This class covers different types of confined spaces and the hazards they present the roles and responsibilities of employers and employees and proper work practices and safety precautions for confined spaces.

Environmental Safety Hazards

This class explains the different types and levels of environmental hazards in the workplace and how employees may be exposed to these hazards. It includes an interactive lab.

Fire Safety and Prevention

This class addresses OSHA fire safety and prevention measures and describes emergency action plans, fire prevention plans, fire detectors and alarms, and fire extinguishing equipment. It includes an interactive lab.

Flammable/Combustible Liquids

This class describes hazards associated with flammable and combustible liquids and explains proper methods for safe storage, handling and transferring of these liquids.

Forklift Training

Powered industrial trucks are the cause of thousands of injuries and nearly 100 deaths per year. In response, OSHA developed the Powered Industrial Truck Standard 29 CFR 1910.178 for general industry. The standard requires employers to train operators concerning operation instructions, features of specific forklifts, safety concerns and workplace conditions. Employees may only operate the classification of truck that they have been trained to operate.

Hand and Power Tool Safety

This class covers general safety guidelines for using hand and power tools as regulated by OSHA.

Introduction to OSHA

This class covers the goals and purposes of the Occupational Safety and Health Administration (OSHA), including its standards programs, as well as interactions with employers and employees.

Lockout/Tagout Procedures

This class covers lockout/tagout requirements and procedures and includes an explanation of employees' roles during lockout/tagout. It includes an interactive lab.

MSDS and Hazard Communication

This class covers different types of chemical hazards, standards for hazardous chemicals, and how information about chemical hazards reaches the employee, including through Material Safety Data Sheets (MSDS). It includes an interactive lab.

Machine Guarding

This class covers basic machine guarding practices and devices and includes information on hazardous machine components, motions and actions.

Machine Shop Safety

This class presents industrial machine operators with a better understanding of the work practices necessary to operate industrial machinery safely. It is the employee's responsibility to work safely at all times, especially when using power driven machinery. Awareness and sound practice of proper safety procedures offer the best defense against workplace injuries.

Metalworking Fluid Safety

This class explains the health and safety risks inherent to working with metalworking fluids and also describes safe practices that help reduce metalworking fluid exposure.

Noise Reduction and Hearing Conservation

This class explains the causes of hearing damage and describes how to avoid exposure to excessive noise.

Personal Protective Equipment

This class addresses personal protective equipment (PPE) requirements from OSHA and includes information about hazard assessments, PPE selection and standards that govern PPE. It includes an interactive lab.

Powered Industrial Truck Safety

This class covers different types of powered industrial trucks, such as forklifts, and includes guidelines for use training requirements and stability principles.

Respiratory Safety

This class covers the most common types of respirators and includes information about fit testing, medical evaluation and training for employees.

Safety for Lifting Devices

This class addresses lifting devices and equipment safety requirements from OSHA and surveys lifting devices and equipment commonly used for material handling inspections and testing.

Walking and Working Surfaces

This class covers the requirements necessary to ensure the safety of typical walking and working surfaces such as platforms, stairs, ladders and scaffolds.

SHOP ESSENTIALS

Basic Blueprint Reading

This course covers topics including basic principles of multi-view projection, dimensioning, section views and metric systems. All topics include hands-on exercises.

Basics of Tolerance

This class explains the purpose of tolerances in manufacturing and describes how these tolerances are specified. It includes an interactive lab.

Blueprint Reading

This class identifies the information communicated on a blueprint with emphasis on interpreting the part drawing. It includes an interactive lab.

Concepts of Calculus

This class covers the basic concepts of calculus.

Geometry: Circles and Polygons

This class explains basic circle and polygon geometry and how their features are used to find dimensions in sample shop drawings.

Geometry: Lines and Angles

This class describes the properties of lines and angles and demonstrates how they are used to solve sample part drawings.

Geometry: Triangles

This class describes the properties of the various types of triangles and demonstrates how they are used to solve sample part drawings.

Interpreting Blueprints

This class provides an overview of common features found in prints and describes how to properly inspect them. It includes an interactive lab.

Math: Fractions and Decimals

This class explains how to add, subtract, multiply and divide fractions and decimals, as well as how to convert these numbers to percentages.

Math: Fundamentals

This class explains how to add, subtract, multiply and divide to solve a problem, following the correct order of operations.

Math: Units of Measurement

This class addresses common units of measurement used in manufacturing and explains how to convert from one unit of measurement to another.

Precision Measurement

This course instructs students how to identify select and use measuring instruments in machining. In addition, it introduces the metric system of measurement.

Shop Algebra Overview

This class explains basic principles of algebra and demonstrates how to solve equations containing multiple operations.

Shop Geometry Overview

This class presents a general overview and refresher for the most common rules of geometry.

Shop Trigonometry Overview

This class presents a general overview and refresher for the rules of trigonometry.

Statistics

This class covers the main concepts of statistics and relates these concepts to shop situations.

Trig: Pythagorean Theorem

This class introduces the Pythagorean theorem and explains how to apply this rule to find unknown information in sample part drawings.

Trig: Sine Bar Applications

This class explains how to use the sine bar for machining and inspection purposes and explains step-by-step examples for using trig ratios and the sine bar to find missing information.

Trig: Sine, Cosine and Tangent

This class explains how to use sine cosine and tangent to find information about the sides and angles of right triangles in sample shop prints.

SOLDERING

Lead-Free Soldering

This class covers the specific characteristics, flux requirements and thermal profile of lead-free solders, as well as the proper techniques to apply when using these new solder materials. It includes an interactive lab.

RCBI IPC 7711 Rework Training Operator (CIS)

IPC's Rework training and Certification Program using the IPC-7711 document is the first formal training program from IPC specifically designed for component rework at the operator level. IPC-7711 Rework Operator Certification students receive IPC certification for the modules relating to the IPC-7711. This course consists of lectures and practical application.

RCBI IPC 7721 PCB Board Level Repair Training Operator (CIS)

IPC's Board Level Repair training and Certification Program using the IPC-7721 document is the first formal training program from IPC specifically designed for board repair and modification at the operator level. IPC-7721 Rework Operator Certification students receive IPC certification for the modules relating to the IPC-7721. This course consists of lectures and practical application.

RCBI IPC WHMA-A-620 CIS Training for Operators

The IPC/WHMA-A-620 Operator/Inspector Training is designed to improve individual discrimination skills; that is, to improve accuracy of discriminating between an acceptable or not acceptable cable or wire harness assembly according to the IPC/WHMA-A-620 document. This program also teaches individuals accept/reject criteria to enhance their ability to consistently and correctly apply the discrimination criteria.

RCBI IPCA-610 CIS Certification for Operators

The IPC-A-610E Acceptability of Electronic Assemblies is the most widely used specification published by the IPC for the electronics manufacturing industry. Worker Proficiency students will be evaluated on their mastery of the material through end-of-course tests that have both open-book and closed-book components.

RCBI J-STD CIS Training

The J-STD-001 Requirements for Soldered Electrical and Electronic Assemblies has become the authority for electronics assembly manufacturing. IPCs J-STD-001 Operator Proficiency Series is a comprehensive knowledge based series of modules that certify students to the methods and procedures presented in the J-STD-001 document. Designed for operators the program consists of lectures demonstrations and labs.

RCBI J-STD-001 CIS Training

The J-STD-001 Requirements for Soldered Electrical and Electronic Assemblies has become the authority for electronics assembly manufacturing. IPCs J-STD-001 Operator Proficiency Series is a comprehensive knowledge based series of modules that certify students to the methods and procedures presented in the J-STD-001 document. Designed for operators the program assists workers interpret the J-STD-001 specification through lecture demonstration and labs.

RCBI Mixed Technology Rework Training - Tin-Lead

This comprehensive course encompasses the skills necessary to perform rework of electronic printed circuit boards to include both through hole and surface mount technologies. The student is introduced to the concept of electrostatic discharge and control methods, component identification, workmanship standards, and hands-on soldering and desoldering techniques using state-of-the-art materials and tools.

Safety for Soldering

This class describes common safety hazards and precautions for soldering applications. It includes an interactive lab.

Solder and Flux Selection

This class describes various types of solder and flux and discusses how to select them for particular applications.

Soldering Applications

This class describes essential skills for proper hand soldering and also explains how to inspect a finished joint and rework or repair a bad joint. It includes an interactive lab.

Soldering Equipment

This class provides an introduction to basic soldering equipment selection, including safety equipment.

Soldering PCBs

This class covers how to create and repair printed circuit assemblies by soldering and desoldering various types of electronic components on printed circuit boards (PCBs).

What Is Soldering?

This class provides an overview of the basic tools and components used for soldering, briefly explores the importance of soldering to the electronics industry, and covers basic procedures for soldering preparation safety and cleanup.

STAMPING

Coil Handling Equipment

This class describes the equipment used in a coil-fed press line and explains general coil line arrangements.

Coil Loading Procedures

This class explains how to properly handle and load coil on the uncoiler, as well as describes how to thread the straightener and feed coil stock into the die area.

Die Components

This class introduces dies, their main components and function within a press.

Die Cutting Variables

This class describes the steps that take place during a cutting operation and shows how clearance impacts the cutting process. It includes an interactive lab.

Die Setting Procedures

This class describes how to change a die and explains proper setup procedures for die setting.

Guiding System Components

This class describes common guiding system components used in die sets, as well as their advantages and disadvantages.

Monitoring Press Operations

This class describes the use of basic controls on a typical press and explains how a press operator monitors the press operation. It includes an interactive lab.

Press Basics

This class introduces common stamping presses, as well as their main components and functions.

Punch and Die Operations

This class introduces common sheet metal operations performed with the help of dies and presses. It includes an interactive lab.

Stamping Safety

This class describes general safety practices that everyone in the shop must observe during a press operation. It includes an interactive lab.

Stripper System Components

The class describes the major types of strippers and springs used in die sets, as well as their advantages and disadvantages.

WELDING

Arc Welding Aluminum Alloys

This class describes the welding characteristics of aluminum and explains how its properties affect each variable in the welding process.

Arc Welding Power Sources

This class describes different types of arc welding power sources and explains how each power source produces welding power.

Arc Welding Processes

This class describes the various arc welding processes, as well as the particular advantages and disadvantages of each process. It includes an interactive lab.

Arc Welding Safety

This class describes general safety practices that all welders must follow during arc welding procedures. It includes an interactive lab.

Arc Welding Symbols and Codes

This class describes welding symbols and how to read them. It also explains the importance of welding codes and the procedures involved for a welding application.

Electrical Power for Arc Welding

This class describes electrical variables, the path of electricity and the effect of electricity on the arc welding process.

Electrode Selection

This class describes electrode characteristics for the four major arc welding processes and explains how to select the appropriate electrode for a specific welding application.

Ferrous Metals for Welding

This class provides an overview of the properties of common ferrous metals used for arc welding.

Flux-cored Arc Welding (FCAW)

This class describes the FCAW process and the variables that affect electrode selection, shielding gas selection and electrode orientation. It includes an interactive lab.

Gas Metal Arc Welding (GMAW)

This class describes the GMAW process and the variables that affect shielding gas selection, electrode selection, metal transfer methods and electrode orientation. It includes an interactive lab.

Gas Tungsten Arc Welding (GTAW)

This course provides a thorough technical understanding of gas tungsten arc welding, arc characteristics, and welding safety. It delivers training that develops the skills necessary to make quality gas tungsten arc welds on 16 and 11 gauge mild steel, .060-inch and .062-inch gauge stainless steel, and .125-inch aluminum using both direct and alternating current.

Gas Tungsten Arc Welding (GTAW) Applications

This class describes the GTAW process and the variables that affect welding current electrode selection, electrode preparation and arc-starting methods. It includes an interactive lab.

Introduction to Submerged Arc Welding (SAW)

This class describes the submerged arc welding process, as well as its advantages and limitations.

Nonferrous Metals for Welding

This class provides an overview of the properties of common nonferrous metals used for arc welding.

Overview of Weld Types

This class describes the various joint and weld types, welding positions and possible weld defects that can occur on a welded joint. It includes an interactive lab.

Oxyfuel Welding Applications

This class describes the procedures for use and maintenance of an oxyfuel welding outfit.

Oxyfuel Welding Safety

This class covers the basic safety procedures for handling oxyfuel welding equipment, including personal protective equipment ventilation and fire safety.

Plasma Cutting

This class describes plasma cutting equipment and the basic procedures for plasma cutting, gouging and piercing.

Shielded and Gas Metal Arc Welding (SMAW and GMAW)

This course provides a thorough technical understanding of arc welding, welding safety, arc welding power sources, electrode classifications and selection. It also provides training to develop the skills necessary to make quality shielded metal and gas arc welds in all positions.

Shielded Metal Arc Welding (SMAW)

This class describes the SMAW process and the variables that affect electrode selection, electrical variables, and methods for starting and extinguishing the arc. It includes an interactive lab.

Stick Pipe Welding

This course will instruct students in welding safety with the Shield Metal Arc Welding process (SMAW-Stick), proper techniques, and electrode selection for welding pipe to meet ASME (vertical-up) welding code. Students will weld using E6010 and E7018.

Submerged Arc Welding (SAW)

This class describes SAW and how to make a submerged arc weld.

Visual Inspection of Welds

This class teaches the visual inspection of welds, the equipment used during a visual inspection, proper inspection procedure and common discontinuities in the surface of a weld.

What Is Arc Welding?

This class introduces the advantages of arc welding as a joining process and explains the fundamentals of arc welding.

What Is Oxyfuel Welding?

This class describes the basic concepts of oxyfuel welding, including what equipment and gases are needed to weld. It also describes various other processes that an oxyfuel torch may be used for.

WORKHOLDING

Chucks, Collets and Vises

This class identifies standard workholding devices used for both the mill and the lathe.

Clamping Basics

This class covers the most common types of clamping components and explains their relative advantages and applications.

Drill Bushing Selection

This class identifies major groups of bushings and their appropriate use.

Fixture Body Construction

This class discusses common tool body forms and the material and cost considerations associated with their construction.

Fixture Design Basics

This class identifies the major factors to consider when beginning the design of a customized fixture. It includes an interactive lab.

Introduction to Workholding

This class introduces the role of a workholding device during the manufacturing process and identifies common groups of these devices.

Locating Devices

This class identifies the most common types of locating components used in custom workholding devices and fixtures.

Supporting and Locating Principles

This class describes the fundamental theory to properly supporting, locating and clamping a workpiece. It includes an interactive lab.



INDEX

21 ST Century Manufacturing Network	7
3D Printers.	7,9
5S Overview	63

A

ABCs of Supervising Others, The	58
About Us	6
AC Fundamentals	43
AC Motor Applications	54
AC Power Sources	43
Acceleration Methods	54
Accreditation and Certification	10
Actuator Applications	45
Additive Manufacturing, Introduction to	51
Adhesive Bonding, Introduction to	35
Adhesive Properties, Introduction to	35
Adhesives, Types of.	35
Administrative Lean.	63
Admission and Registration	18
Degree-Seeking Student Admission Requirements and Policies	19
Non-Degree-Seeking Student Admission Requirements and Policies	20
Advanced Materials for Composites.	41
Advanced Thermoset Resins for Composites.	42
ANSI Insert Selection	53
Applications for Robots.	68
Approaches to Maintenance	63
Approaches to Quality Management.	63
Arc Welding Aluminum Alloys	75
Arc Welding Power Sources	75
Arc Welding Processes	75
Arc Welding Safety	75
Arc Welding Symbols and Codes	75
Arc Welding, What is	77
AS9100 Internal Auditor Training.	64
AS9100 Review of Requirements	64
Assembly, Safety for	44
Associate in Applied Science Degree Program.	23
Attendance	11

B

Band Saw Blade Selection	53
Basic Blueprint Reading	71
Basic Hydraulic System Design	45
Basic Laser Tracker and CAM2 Measure Training	35
Basic Measurement.	47
Basic PLC Programming.	56
Basic Pneumatic Circuit Design	45
Basics of Ladder Logic	56
Basics of Manufacturing Costs.	58

Basics of the CMM	47
Basics of the CNC Machining Center	36
Basics of the CNC Swiss-type Lathe	36
Basics of the CNC Turning Center	36
Basics of the Engine Lathe	50
Basics of the Manual Mill	50
Basics of the Optical Comparator	47
Basics of Tolerance	71
Battery Selection	43
Bearing Applications	52
Behavioral Interviewing Techniques	58
Belt Drive Applications	52
Benchwork and Layout Operations	50
Bending Fundamentals	57
Bloodborne Pathogens	69
Blueprint Reading	71
Bonding Process, Basics of the	34
Budgets and Managing Money	58
Building Better Teams	58
Building Relationships for Success in Sales	58
Building Your Self Esteem and Assertiveness Skills	58
Business Etiquette: Gaining That Extra Edge	58
Business Leadership: Becoming Management Material	59
Business Writing that Works	59

C

CAD/CAM Overview	35
CAD/CAM Software	35
Cancellation	20
Cancellation by RCBI	20
Canned Cycles	36
Carbide Grade Selection	53
Cell Design and Pull Systems	64
Centerless Grinder Operation	34
Centerless Grinders, Setup for	34
Ceramics	50
Change and How to Deal with It	59
Chucks, Collets and Vises	77
Circuits, Introduction to	44
Clamping Basics	77
Classroom-based Training	15
Client-site or RCBI-site Customized Training	15
Clutch and Brake Applications	52
CNC, History and Definition of	39
CNC, Mechanics of	41
CNC Coordinates	36
CNC Introduction to Machining, Operation and Programming - Level One	37
CNC Manual Operations	37
CNC Offsets	37
CNC Specialist, RCBI Technical Training Program	25

CNC Specifications for the Lathe	37
CNC Specifications for the Mill	37
Coaching: A Leadership Skill	59
Coating Defects.	41
Coil Handling Equipment.	74
Coil Loading Procedures.	74
Communication Strategies	59
Composite Inspection and Defect Prevention.	42
Composite Processing, Safety for.	42
Composite Structures: Fabrication and Damage Repair - Phase 1	42
Composites Structures: Fabrication and Damage Repair - Phase 2	42
Composite Structures: Fabrication and Damage Repair - Phase 3	42
Composites, Traditional.	43
Compression Molding, Introduction to	42
Computer-Aided Design - Introduction to 3D Modeling	35
Computer-Numerical-Control (CNC) Specialist.	25
Concepts of Calculus	71
Concepts of Robot Programming	68
Conduct.	11
Conducting an Internal Audit.	64
Conducting Effective Performance Reviews	59
Conducting Kaizen Events	64
Conductor Selection	43
Confined Spaces.	69
Conflict Resolution: Dealing with Difficult People	59
Conflict Resolution for Different Groups	59
Conflict Resolution: Getting Along in the Workplace	59
Conflict Resolution Principles	59
Contactors and Motor Starters	54
Contamination and Filter Selection	45
Control Devices.	55
Course Billing	21
Creating a Mazatrol Program for the Lathe	37
Creating a Mazatrol Program for the Mill	37
Creating a Milling Program	37
Creating an EIA/ISO Program for the Mazak Lathe.	37
Creating an EIA/ISO Program for the Mazak Mill	37
Creating a Turning Program	37
Customer Service Training - Critical Elements of Customer Service	59
Customer Service Training: Managing Customer Service	60
Cutting, What is.	54
Cutting Fluids	53
Cutting Processes.	53
Cutting Tool Materials	53
Cutting Variables	53
Cylindrical Grinder Operation	34

D

Data Manipulation	56
DC Circuit Components	43

DC Motor Applications	55
DC Power Sources	43
Deceleration Methods	55
Die Bending Operations	57
Die Components	74
Die Cutting Variables	74
Die Setting Procedures	74
Dismissal	21
Distribution Systems	55
Diversity Training: Celebrating Diversity in the Workplace	60
Dressing and Truing	34
Drill Bushing Selection	77
Drill Geometry	53
Dynamite Sales Presentations	60

E

Electrical Instruments	43
Electrical Power for Arc Welding	75
Electrical Print Reading	43
Electrical Units	43
Electrode Selection	76
Electronic Semiconductor Devices	55
Employee Dispute Resolution: Mediation through Peer Review	60
End Effectors	68
Engine Lathe Operation	50
Environmental Safety Hazards	69
Equal Opportunity / Affirmative Action Policy	10
Equipment	9
Essentials of Communication	60
Essentials of Leadership	60

F

Facilitation Skills	60
Facilities	8
FARO CAM2 Q	35
FCAW Applications	76
Ferrous Metals and Alloys	50
Ferrous Metals for Welding	76
Financial Assistance and Scholarships	19, 22
Financial Information	19, 21
Academic Dismissal	21
Attendance	21
Cancellation	20
Cancellation by RCBI	20
Course Billing	21
Grading	21
Liability	21
Multiple Attendee Discounts	21

Registration Deadlines	20
Readmission	20
Transfer Students	20
Transfer to Other Colleges and Institutions	20
Tuition and Fees	19
Unsatisfactory Progress	21
Fire Safety and Prevention	70
Fittings for Fluid Systems	45
Fixture Body Construction	78
Fixture Design Basics	78
Flammable/Combustible Liquids	70
Fluid System Print Reading	45
Fluid Systems, Preventive Maintenance for	46
Forces of Machines	52
Forklift Training	70

G

Gas Tungsten Arc Welding (GTAW)	76
GE Fanuc Lathe: Control Panel Overview	37
GE Fanuc Lathe: Entering Offsets	38
GE Fanuc Lathe: First Part Runs	38
GE Fanuc Lathe: Locating Program Zero	38
GE Fanuc Lathe: Program Execution	38
GE Fanuc Lathe: Program Storage	38
GE Fanuc Mill: Control Panel Overview	38
GE Fanuc Mill: Entering Offsets	38
GE Fanuc Mill: First Part Runs	38
GE Fanuc Mill: Locating Program Zero	38
GE Fanuc Mill: Program Execution	38
GE Fanuc Mill: Program Storage	38
Gear Applications	52
Gear Geometry	52
Geometric Dimensioning & Tolerancing Fundamentals	47
Geometry: Circles and Polygons	71
Geometry: Lines and Angles	71
Geometry: Triangles	72
GMAW Applications	76
Goals	10
Grading	21
Grinding, What Is	34
Grinding Processes	34
Grinding Variables	34
Grinding Wheel Geometry	34
Grinding Wheel Materials	34
Guiding System Components	75
GTAW Applications	76

H

Haas Lathe: Control Panel Overview	38
Haas Lathe: Entering Offsets	39
Haas Lathe: First Part Runs	39
Haas Lathe: Locating Program Zero	39
Haas Lathe: Program Execution	39
Haas Lathe: Program Storage	39
Haas Mill: Control Panel Overview	39
Haas Mill: Entering Offsets	39
Haas Mill: First Part Runs	39
Haas Mill: Locating Program Zero	39
Haas Mill: Program Execution	39
Haas Mill: Program Storage	39
Hand and Power Tool Safety	70
Hand-Held Programmable PLCs	56
Harassment and Discrimination	60
Hard Turning	53
Hardness Testing	47
Hardware for PLCs	56
Heat Treatment of Steel	51
High-Speed Machining	53
History and Definition of CNC	39
Hole Inspection	47
Holemaking on the Mill	50
Human Resources Training For the Non-HR Manager	60
Hydraulic Control Valves	45
Hydraulic Fluid Selection	45
Hydraulic Power Sources	46
Hydraulic Power Variables	46
Hydraulic Principles and System Design	46
Hydraulics and Pneumatics, Safety for	46

I

Incident Investigation Training with Root Cause Analysis, Problem-solving and Corrective Action	64
Industrial Network Integration	68
In-shop Training	15
Inspecting with CMMs	47
Inspecting with CMMs (Coordinate Measurement Machines)	35
Inspecting with Optical Comparators	47
Internal Auditor Training for Quality & Environmental Management	64
Interpersonal Communication	48, 61
Interpreting Blueprints	72
Interpreting GD&T	47
Introduction to Abrasives	34
Introduction to Additive Manufacturing (AM)	51
Introduction to Adhesive Properties	35
Introduction to Assembly	44
Introduction to Circuits	44

Introduction to Coating Composition	41
Introduction to Composites.	42
Introduction to Compression Molding.	42
Introduction to EDM	39
Introduction to Electric Motors	55
Introduction to Fastener Ergonomics	44
Introduction to Fastener Threads	44
Introduction to Fluid Conductors	46
Introduction to Fluid Systems	46
Introduction to GD&T	47
Introduction to Hydraulic Components.	46
Introduction to Lay-up and Spray-up Molding	42
Introduction to Machine Rigging.	68
Introduction to Magnetism	44
Introduction to Managerial Accounting	61
Introduction to Materials	51
Introduction to Mechanical Systems.	52
Introduction to OSHA	70
Introduction to PLCs	56
Introduction to Pneumatic Components.	46
Introduction to Robotics	68
Introduction to Screw Machining	53
Introduction to Six Sigma	64
Introduction to Social Media for Manufacturers	61
Introduction to Submerged Arc Welding (SAW)	76
Introduction to Supply Chain Management	64
Introduction to Workholding	78
Inventory Management: The Nuts and Bolts.	61
ISM Principles of Supervision & Management.	60
ISO 14001 Environmental Management System Overview.	65
ISO 14001 Internal Auditor Training	65
ISO 9000 Overview	65
ISO 9001 Internal Auditor Training	65
ISO 9001 Review of Requirements	65
ISO/TS 16949 (Understanding)	67
ISO/TS 16949 Internal Auditor Training.	65
IT Fundamentals of Computers.	48, 61

L

Lead-Free Soldering	73
Lean Manufacturing & Simulation	65
Lean Manufacturing Overview.	65
Lifting and Moving Equipment	68
Limit Switches and Proximity Sensors	55
Linear Instrument Characteristics	47
Locating Devices.	78
Lockout/Tagout Procedures	70
Logic and Line Diagrams.	55
Lubricant Fundamentals	52

M

Machine Guarding	70
Machines for Metal Cutting	53
Machine Shop Safety	70
Machining Titanium Alloys	53
Machinist/Machine Setter Program	28
Machinist Technology	23
Machinist Technology, RCBI Technical Training Certificate Program	23
Machinist Technology/CNC (Computer-Numerical-Control) Associate Degree in Applied Science	23
Magnetism, Introduction to	44
Managing Performance: Best Practices	61
Managing Performance: Corrective Actions	61
Managing Practices for Total Quality	66
Managing the Diverse Workplace	61
Manual Mill Operation	50
Marketing and Sales	61
Mastercam Advanced	36
Mastercam Fundamentals	36
Mastercam Intermediate	36
MAT Mathematics for Machinist Technology	48
Math for PLCs	56
Math: Fractions and Decimals	72
Math: Fundamentals	72
Math: Units of Measurement	72
Mazak Lathe: Control Panel Overview	40
Mazak Lathe: Entering Offsets	40
Mazak Lathe: First Part Runs	40
Mazak Lathe: Locating Program Zero	40
Mazak Lathe: Program Execution	40
Mazak Lathe: Program Storage	40
Mazak Lathe: Safety for the Lathe	40
Mazak Mill: Control Panel Overview	40
Mazak Mill: Entering Offsets	40
Mazak Mill: First Part Runs	40
Mazak Mill: Locating Program Zero	40
Mazak Mill: Program Execution	40
Mazak Mill: Program Storage	40
Mazak Mill: Safety for the Mill	41
Measuring System Analysis	48
Mechanical Power Variables	52
Mechanical Properties of Metals	51
Mechanics of CNC	41
Meeting Management: The Art of Making Meetings Work	61
Metal Classification	51
Metal Manufacturing	51
Metal Removal Processes	54
Metalworking Fluid Safety	70
Metrics for Lean	66
MFE Computer-Aided-Design (CAD)	48

Milling Calculations	41
Milling Geometry	54
Misconduct	11
Mission	8
Monitoring Press Operations.	75
MSDS and Hazard Communication	70
MT Blueprint Reading	48
MT CNC Set up/Operation	48
MT Computer-Aided-Manufacturing	49
MT Industrial Safety	49
MT Introduction to CNC Machining	49
MT Introduction to Machinery	49
MT Machine Safety	49
MT Metalworking Theory and Application	49
MT NIMS Credentialing	49
MT NIMS Credentialing/CNC Project	49
MT Precision Measurement.	49

N

NEC Overview	44
Negotiating for Results	62
Networking for PLCs	56
Noise Reduction and Hearing Conservation	71
Nonferrous Metals and Alloys	51
Nonferrous Metals for Welding	76
Numbering Systems and Codes	57

O

Office Ethics and You: Making Good Decisions	62
Online/Independent Study Programs and Courses	15
Operating the Press Brake	57
Optimizing Insert Life	54
Orientation Handbook: Getting Employees off to a Good Start	62
Overcoming Objections: Nailing the Sale	62
Overview of Composite Processes	42
Overview of Engine Lathe Setup.	50
Overview of Manual Mill Setup	50
Overview of Non-Threaded Fasteners	44
Overview of Plastic Materials	51
Overview of Plastic Processes	51
Overview of PLC Registers	57
Overview of Properties for Plastics	51
Overview of Threaded Fasteners	44
Overview of Threads	48
Overview of Weld Types	76
Oxyfuel Welding Applications	76
Oxyfuel Welding Safety	76
Oxyfuel Welding, What is.	77

P

Parallel Circuit Calculations	44
Part Program	41
Performance Management and the Law	62
Performance Management: Managing Employee Performance	62
Performance Reviews, Conducting Effective	59
Personal Finance	62
Personal Protective Equipment	71
Photoelectric and Ultrasonic Devices	55
Photonic Semiconductor Devices	55
Physical Properties of Metals	51
PID for PLCs	57
Plasma Cutting	77
Plastics	51
PLC Diagrams and Programs	57
PLC Inputs and Outputs	57
PLC Installation Practices	57
PLC Program Control Instructions	57
PLC Timers and Counters	57
Pneumatic Control Valves	46
Pneumatic Power Sources	46
Pneumatic Power Variables	46
Policies for Non-Degree Seeking Students	20
Powered Industrial Truck Safety	71
Power Transmission Components	52
Precision Measurement	72
Press Basics	75
Press Brake Components	58
Press Brake Safety	58
Press Brake Specifications	58
Principles of Injection Molding	51
Principles of Thermoforming	51
Problem Solving and Decision Making	62
Process Flow Charting	66
Processes for Applying Coatings	41
Properties for Fasteners	44
Prospecting for Leads Like a Pro	62
Public Speaking: Presentation Survival School	63
Punch and Die Operations	75

Q

Quality Overview	66
----------------------------	----

R

RCBI IPC 7711 Rework Training Operator (CIS)	73
RCBI IPC 7721 PCB Board Level Repair Training Operator (CIS)	73
RCBI IPCA-610 CIS Certification for Operators	73

RCBI IPC WHMA-A-620 CIS Training for Operators	73
RCBI J-STD-001 CIS Training	73
RCBI J-STD CIS Training	73
RCBI Mixed Technology Rework Training - Tin-Lead	74
Readmission	20
Reduced Voltage Starting	55
Registration Deadlines	20
Repair Methods for Composites	42
Respiratory Safety	71
Reversing Motor Circuits	55
Rigging Equipment	68
Rigging Inspection and Safety	68
Rigging Mechanics	68
Robot Axes	68
Robot Components	69
Robotic Control Systems	69
Robotic Drives, Hardware and Components	69
Robot Installations	69
Robot Maintenance	69
Robot Safety	69
Robot Sensors	69
Robot Troubleshooting	69

S

Safety for Assembly	44
Safety for Composite Processing	42
Safety for Electrical Work	44
Safety for Hydraulics and Pneumatics	46
Safety for Lifting Devices	71
Safety for Mechanical Work	52
Safety for Metal Cutting	54
Safety for Soldering	74
SAW Applications	77
Sawing Fundamentals	54
Selling Smarter	63
Sequencer Instructions for PLCs	57
Series Circuit Calculations	44
Setup for Centerless Grinders	34
Shielded and Gas Metal Arc Welding (SMAW and GMAW)	77
Shift Registers	57
Shop Algebra Overview	72
Shop Geometry Overview	72
Shop Trigonometry Overview	72
Six Sigma, Introduction to	64
Six Sigma Black Belt	66
Six Sigma Champion	66
Six Sigma Goals and Tools	66
Six Sigma Green Belt	66
Six Sigma Overview	67
Skills for the Administrative Assistant	63

SMAW Applications	77
Solder and Flux Selection	74
Soldering, Safety for	74
Soldering, What is	74
Soldering Applications	74
Solder Center of Excellence	7
Soldering Equipment	74
Soldering PCBs	74
Solenoids	55
Solid-State Relays and Starters	56
SolidWorks Essentials	36
SPC Overview	66
Specifications for Servomotors	56
Speed and Feed Selection	54
Spring Applications	53
Staff and Trainers	4
Stamping Safety	75
Statistics	72
Steps for Adhesive Application	35
Stick Pipe Welding	77
Strategic Partners	14
Strategies for Setup Reduction	67
Stress Management	63
Stripper System Components	75
Structure of Metals	52
Student Code of Conduct	11
Supervising Others, The ABCs of	58
Supply Chain Management, Introduction to	64
Supporting and Locating Principles	78
Surface Finishing Composites	43
Surface Grinder Operation	34
Surface Measurement	48
Surface Preparation	35
Surface Preparation for Coatings	41
Symbols and Diagrams for Motors	56

T

Taper Turning on the Engine Lathe	50
Team Leadership	63
Technical Report Writing	49, 63
The Forces of Fluid Power	45
Thermoset Resins for Composites, Advanced	42
Threaded Fastener Selection	45
Threading on the Engine Lathe	50
Thread Inspection	48
Timers and Counters	56
Tool Geometry	54
Toolholders for Turning	54
Tools for Threaded Fasteners	45
Torque, Understanding	45

Total Productive Maintenance Overview	67
Traditional Composites	43
Training Options	15
Transfer Students	20
Transfer to Other Colleges and Institutions	20
Trig: Pythagorean Theorem	72
Trig: Sine Bar Applications	72
Trig: Sine, Cosine and Tangent	72
Troubleshooting Coating Defects	41
Troubleshooting: Identifying Problems	67
Troubleshooting: Taking Corrective Actions	67
Troubleshooting: Understanding Causes and Effects	67
TS 16949: 2002 Overview	67
Tuition and Fees	19, 21
Turning Calculations	41
Types of Adhesives	35

U

Understanding ISO 50001 for Improved Energy Management	67
Understanding ISO/TS 16949	67
Understanding Torque	45

V

Vacuum Bagging Technique: Single-Sided Bagging	43
Value Stream Mapping: The Future State	67
Value Stream Mapping: The Present State	68
Values	10
Video Conferencing	15
Vision Systems	69
Visual Inspection of Welds	77

W

Walking and Working Surfaces	71
Welding Technology Associate Degree in Applied Science	25
What is Arc Welding?	77
What is Cutting?	54
What is Grinding?	34
What Is Oxyfuel Welding?	77
What Is Soldering?	74

INFORMATION CONTAINED HEREIN IS SUBJECT TO CHANGE WITHOUT NOTICE

Release Date June 2012

RCBI is committed to equal opportunities for all individuals. RCBI provides equal opportunities to all prospective and current students and workers without regard to race, color, religion, sex, age, sexual orientation, disability or national origin.



HUNTINGTON

1050 Fourth Avenue
Huntington, WV 25701

p: 304.781.1625 • 800.469.RCBI
f: 304.781.1623 • **e:** mfg@rcbi.org



CHARLESTON

100 Angus E. Peyton Drive
South Charleston, WV 25303

p: 304.720.7741 • 800.469.RCBI
f: 304.746.8926 • **e:** mfg@rcbi.org



BRIDGEPORT

2400 E. Benedum Industrial Drive
Bridgeport, WV 26330

p: 304.848.2270 • 800.469.RCBI
f: 304.842.0436 • **e:** mfg@rcbi.org



ROCKET CENTER

410 State Route 956
Rocket Center, WV 26726

p: 304.597.2010 • 800.469.RCBI
f: 304.726.7048 • **e:** mfg@rcbi.org

www.rcbi.org