COURSE OFFERINGS
WORKFORCE & ECONOMIC DEVELOPMENT / COMMUNITY EDUCATION

INDUSTRY 4.0 IS HERE

Business Courses • Computers • HEP
Healthcare Programs • IT Certifications • Workforce
Online Courses & Certificates • Technical Training

Ten South Second Street, Reading, PA   |   610.607.6232   |   1.800.626.1665   |   racc.edu   |   Sponsored by the County of Berks
Ask us about WEDnet PA Grant Funding for your employee training!

Contact Allison Creveling @ 610.607.6208

Please visit our Welcome Center in the Berks Hall lobby.

Discover a new career path!
Meet our friendly staff!
Learn about our credit and certificate programs!

Monday, Thursday, Friday: 8:00 AM - 5:00 PM
Tuesday, Wednesday: 8:00 AM - 7:30 PM
Call 610.607.6224 or visit racc.edu

WARRANTY DISCLAIMER. The College and its affiliates hereby disclaim all warranties, whether express, implied or statutory, including, without limitation, any implied warranty of merchantability or fitness for a particular purpose employability, future employment, licensure, certification or availability of courses, program, instructors or curriculum.

For more information on our graduation rates, the median debt of students who have completed programs and other important information, please visit our website at racc.edu/HEOA.

It is the policy of Reading Area Community College to prohibit discrimination on the basis of race, color, sex, sexual orientation, religion, national or ethnic origin, age, disability, or status as a disabled or Vietnam Era veteran in regard to the administration of all campus programs, services and activities and the admission of students, employment actions, or other sponsored activities. Furthermore it is RACC's policy not to tolerate harassment of any type, including sexual harassment, of or by any employee, student, contractor, vendor, and/or visitor to Reading Area Community College. In addition it is the policy of Reading Area Community College not to discriminate on the basis of sex in its educational programs and activities as required by Title IX of the Education Amendments of 1972. Title IX provides that "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance." Sex discrimination includes sexual harassment and sexual assault.

Affirmative Action inquiries should be directed to the Affirmative Action Officer, RACC, P.O. Box 1706, Reading, PA 19603 (610.372.4721). All colleges and universities, in compliance with the Pennsylvania College and University Security and Information Act of 1988 and the Student Right-to-Know and Campus Security Act, are required to provide information regarding safety and security procedures and statistics on campus. A copy of this report is available by contacting Marketing and Communications, Room 323, Berks Hall.
Healthcare Programs

CAREER TRAINING

DENTAL ASSISTANT*
624.5 Hrs. $6,125
Start date: Summer 2019
This part-time program will prepare individuals for employment in a dental office. Students will receive theory and practical applications regarding chair-side assisting. Students will also learn basic laboratory procedures, infection control, radiation health and safety, and prepare to take the state certification exam in radiology. In addition to classroom instruction, there is a 200-hour internship in a dental office.
For gainful employment visit https://goo.gl/1eNjE3

PHLEBOTOMY WITH EKG TRAINING*
444.5 Hrs. $6,050
Classes begin every 6 weeks
This program prepares individuals to collect blood from adult patients, donor patients and perform EKGs. The initial component of training will consist of basic medical courses and a word processing course. The second part of this training consists of a full-time (day) clinical internship. For gainful employment visit https://goo.gl/TUJVca

NURSE AIDE*
120 Hrs. $1,390
Classes begin every 6 weeks
This program prepares students for employment in a long-term care facility. During this course, the student will be presented with both theory and practical information regarding patient care. This course meets the requirements of the state of Pennsylvania. Students completing the course will be eligible to

MEDICAL/DENTAL INSURANCE & BILLING SPECIALIST
639 Hrs. $7,010
Classes begin every 6 weeks
This program focuses on developing the administrative skills necessary to be a successful Medical Insurance and Billing Specialist. This fast growing field offers employment opportunities in doctors’ offices, dental offices, insurance companies, hospitals, and home-based businesses. Three years of business or administrative experience is required for this course of study. Students complete a 150-hour internship. For gainful employment visit https://goo.gl/HQdYm3

MEDICAL ASSISTING*
675 Hrs. $7,715
Classes begin every 6 weeks
This program prepares students to function in a variety of entry-level capacities in hospitals, clinics, and doctors’ offices. Students will develop skills in medical terminology, computerized medical office procedures and other front office duties. In addition, students will learn back office skills, including administering injections and immunizations, dispensing medications, drawing blood, and performing EKGs and CPR. Students complete a 150-hour internship. At the conclusion of this program, students will sit for CCMA certification (included). For gainful employment visit https://goo.gl/4hkRNV

MEDICAL RECEPTIONIST
654 Hrs. $7,210
Classes begin every 6 weeks
This program prepares individuals for employment as a receptionist in a medical office or other healthcare setting. Students will learn keyboarding skills and medical office procedures including answering the telephone, scheduling patients, maintaining files, and directing visitors. Instruction will also prepare individuals for related clerical duties using medical terminology in hospitals, clinics or lab facilities. Students complete a 150-hour internship. For gainful employment visit https://goo.gl/tQuxDq

* Proof of personal medical insurance required.
All programs require a criminal background check free of prohibitive offenses.
Please call 610.375.8188 for additional information on these programs.
Healthcare Programs

MEDICAL SECRETARY
657 Hrs. $7,300
Classes begin every 6 weeks

This program is designed to help students with basic clerical skills advance their skill set to work as a Medical Secretary. Completing this course will prepare the student for administrative duties such as transcription, patient scheduling and insurance and billing. Students complete a 150-hour internship.

For gainful employment visit https://goo.gl/QaxzwQ

Please call 610.375.8188 for additional information on these programs.

“"I chose RACC because it offered a six-month career program that was close to home. Six months is a short amount of time to dedicate to bettering yourself and your career. While I was at RACC, I learned how to be a successful student. The staff at RACC helped me achieve my goals by setting high standards, answering all questions and working with me. My experience at RACC was pleasant and I would definitely do it all again.”

~Michelle Drumheller, Medical Office Supervisor

Financial aid, scholarships and/or other financial help may be available for some classes!

VETERINARY ASSISTANT*
160 Hrs. $1,700
Start date: September 2019

This program will provide the student with the basic, entry-level knowledge and skills necessary for pursuing a career in a veterinary hospital as an assistant. This training is technically challenging. The program includes classroom and animal restraint competencies that must be successfully demonstrated prior to clinical placement for hands-on experience in local veterinary hospitals. Mastering medical terminology and basic technical veterinary skills are an integral part of the training.

Are you a Medical Assistant wishing to be certified?

Are you interested in preparing for and taking your CCMA certification exam?

Cost: $695 (includes a test prep guide, practice tests and a one-time NHA Test)

If you have been a practicing clinical medical assistant for one year and/or have previously taken RACC’s Medical Assisting Program, you are ready for the NHA certification test prep course. This 21-hour classroom session will cover information in preparation for the NHA exam. Benefits in obtaining a Clinical Medical Assistant Certification may include: more job opportunities, increased pay scale, job security, and increased subject matter expertise.

The class will include a NHA test prep book and cover information on the following:

- Patient Care
- Communications
- Medical Law and Ethics
- Office Administration
- Medication Administration
- Electrocardiography
- Phlebotomy and Specimen Handling
- Infection Control
- Medical Terminology

Classes are held Mondays from 6pm-9pm for 7 weeks.

*Must possess a high school diploma or GED.

Reading Area Community College is now an NHA testing site for Medical Assistants!

Please call 610.375.8188 to schedule your course today!
Healthcare Programs

To register online follow instructions on page 52 and select topic code CPR.

Please call 610.607.6220 for additional information on these programs.
Reading Area Community College is pleased to announce a series of classes for healthcare professionals who are interested in learning more about the insurance and billing side of the practice. Each class will run twice a week for a period of six weeks.

Classes begin every six weeks!

MEDICAL INSURANCE AND CODING 1*
ZINS-601 $345 3:10–5:10 PM TTh
This class introduces students to the coding that is used in submitting claims to the various insurance carriers. Students will become familiar with ICD-10 codes, CPT codes and HCPC codes. Students will be using various coding books to become familiar with looking up codes and the format of each book. Students will also review the data fields that are used to complete 1500 forms and discuss common errors on claim forms which may lead to denials from insurance carriers.

MEDICAL INSURANCE AND CODING 2*
ZINS-606 $400 5:10–7:40 PM TTh
This class discusses the specifics of the various health insurance plans and programs offered in the United States today. Topics include Blue Cross, Blue Shield, commercial insurance plans, Medicare, Medicaid, Tri-care, Workers’ Compensation, and Disability. The class will also review the cash flow cycle, common reasons why claims do not get paid, the A/R function, the importance of patient education and the collection process.

INTRO TO INSURANCE*
ZINS-600 $345 1:00–3:00 PM MW
This class introduces students to the basic insurance concepts and types of insurance plans offered in the United States today. This information is especially useful for people who purchase insurance through the Patient Protection and Affordable Care Act (“Obamacare”) and for healthcare personnel who may have to address questions from patients about their insurance plans. The class will discuss Major Medical (Fee for Service) plans, Preferred Provider Organization (PPO) plans, Point of Service (POS) plans, Health Maintenance Organization (HMO) plans, High Deductible Heath Plans (HDHP) as well as Health Saving Accounts, Health Reimbursement Accounts, Flexible Spending Accounts, and Dependent Care Accounts. Other topics including Medicare and Medicaid plans and a coordination of benefits will also be discussed.

MEDICAL INSURANCE AND CODING 1*
ZINS-607 $345 5:10–7:10 PM MW
This class offers students a database practice simulation of the steps needed to register patients with demographics. The student also gains experience in adding insurance plans, entering data (codes and charges) from visits and for services, posting co-pays from patients, submission of claims to insurance carriers, posting payments from EOBs/RAs, mailing of patient statements and posting patient payments after patient statements have been sent out. Topics will include insurance coordination of benefits, effective and termination dates of plans, patients that have multiple insurance cases (employer group plan, MVA, WC).

DENTAL INSURANCE AND CODING
ZINS-605 $345 8:00 AM–12:00 PM F
This class discusses the specifics of dental plans along with their provisions and limitations. Students will access the internet to learn about current dental procedures and dental plans. Discussion will involve the specialty practices of modern dentistry, plan design and payment methods, and will also be discussing Insurance rules and regulations. Students will learn the differences between billing dental and/or medical plans for services and review completion of forms and coordination of benefits. Mathematical calculations will be explained as they apply to orthodontia as well as the use of an FSA to supplement dental coverage.

To register online follow instructions on page 48 and select topic code Insurance

*Book available in RACC Bookstore. Please call 610.375.8188 for additional information.
ONLINE TRAINING

Reading Area Community College is pleased to provide online CPR training.
1. BLS Provider
2. Heartsaver CPR/AED
3. Heartsaver CPR/AED First Aid
4. Heartsaver First Aid
5. ACLS
6. PALS

Follow these simple steps to a successful course completion:
1. Sign on to http://www.onlineAHA.org
2. Choose your course (fee varies by course)
3. Complete the online portion and print your certificate
4. Schedule a skills test

A skills session is the hands-on portion of an AHA online course. It is conducted in person after the student completes the online course. To schedule a skills session contact us at 610.607.6220.

Payment of $50 must be paid prior to taking the skills test.

By Phone: Call 610.607.6235 or 610.607.6231 to register with VISA, MasterCard or Discover.

In Person: RACC, Berks Hall Room 107, 10 South Second Street,

Monday and Thursday 8:00 AM - 4:30 PM;
Tuesday and Wednesday 8:00 AM - 6:30 PM;
Friday 8:00 AM - 4:00 PM

Class Location: Reading Area Community College (RACC)

Please call 610.607.6220 for additional information on these programs.
BECOME A CERTIFIED AUCTIONEER!

At the completion of the auctioneering course, the student will be able to take the Pennsylvania State Auctioneer’s License Exam and, upon passing of this exam, become a Pennsylvania Licensed Auctioneer.

The content of this course is designed to provide students with knowledge of the techniques, procedures, and principles of communication and marketing, appraisal, management and law necessary to conduct a successful auction. The course also includes practical field experience of on-the-job training with Pennsylvania-licensed auctioneers.

The Auctioneering Program meets all educational course requirements necessary to sit for the PA State Auctioneer’s License Exam.

- Scholarships available
- Approved for Veterans and OVR Benefits

Spring 2020
Cost: $3,800

Please call 610.375.8188 for more information.
## COMPUTERS

### INTRODUCTION TO PERSONAL COMPUTERS

**ZCOM-600**  
**$90**  
**10:00 AM-4:30 PM**  
**F**

If you are a new computer user this course is for you. Course content includes computer start-up, running programs, menus, basic computer concepts, file management and information about storage media.

### MS WORD 2010 - Level 1*

**ZCOM-601**  
**$345**  
**10:10 AM-12:10 PM**  
**TTh**

Learn to use one of the most sophisticated and widely used word processing programs available! During this introductory course, you will explore the Word 2010 environment. Students will create, save, edit, and proofread documents, change the look of text, change the look of a document, and get help in Office 2010. **Prerequisite: Familiarity with working in the Windows environment and working with a keyboard and mouse. Please bring a memory stick or flash drive to class.**

### MS Word 2010 - Level 2*

**ZCOM-602**  
**$345**  
**10:10 AM-12:10 PM**  
**MW**

Take your Word skills to the next level! During this intermediate course you will learn to present information in columns and tabs, work with graphics, symbols, and equations, work with diagrams and charts, and work with longer documents. Includes an introduction to mail merge. **Prerequisite: Word 2010 Level 1 or equivalent experience. Please bring a memory stick or flash drive to class.**

### MS EXCEL 2010 - Level 1*

**ZCOM-603**  
**$345**  
**1:00-3:00 PM**  
**TTh**

Starts with an introduction to Excel 2010. Learn techniques for entering data into cells, working with data, and using data tables more efficiently. Discover how to finish your workbook, and how to navigate and get help in Excel 2010. The class will also cover basic techniques for filtering and limiting data that can be entered into individual cells. **Previous Windows experience recommended. Please bring a memory stick or flash drive to class.**

### MS EXCEL 2010 - Level 2*

**ZCOM-604**  
**$345**  
**1:00-3:00 PM**  
**MW**

Build your Excel skills with intermediate techniques for sorting and summarizing data. Learn to create dynamic charts and graphs. Practice utilizing formulas and functions, and develop your ability to collaborate with colleagues using passwords, comments, and change-tracking. **Prerequisite: Excel 2010 Level 1 or equivalent experience. Please bring a memory stick or flash drive to class.**

### OVERVIEW OF OUTLOOK 2010

**ZCOM-605**  
**$45**  
**1:00-4:00 PM**  
**F**

In this overview of the vast Outlook software, you will learn to navigate and learn the tools for email, calendar, contacts, and tasks. This class will focus on what Outlook has to offer—not the basic skills of email. Learn how to sort your inbox and organize it with folders. Create rules to help you better manage your email and Quick Steps to make those common tasks go “quicker.” Learn the different types of appointments in the calendar.

### INTERNET WORKSHOP

**ZCOM-608**  
**$90**  
**10:00 AM-4:30 PM**  
**F**

This six-hour course introduces students to internet browser features, locating internet sources and using email features.

### KEYBOARDING I*

**ZCOM-606**  
**$345**  
**3:10-5:10 PM**  
**TTh**

This course is designed to teach students keyboarding skills for those with no prior keyboarding background or for students who wish to improve previously learned skills. This course emphasizes touch control of the keyboard and proper keyboarding techniques. Students will be keyboarding 25-45 words per minute with five or less errors as demonstrated by a five-minute timed test.

*Book available in RACC Bookstore. Please call 610.375.8188 for additional information.

to register online follow instructions on page 48 and select topic code Computers
NON-PROFIT MANAGEMENT AND LEADERSHIP SERIES
ZCAR 341 - 1119
Cost: $50
Sessions: 2-hours per class, Tuesday & Thursday evenings 6pm-8pm for 3 sessions – September 19, & September 24 & 26

Today, what non-profit organizations do is vast, diverse, and invaluable to American life. Non-profits are the primary drivers of social change and the providers of a wide array of goods and services to a diverse group of individuals. However, if non-profit organizations are to effectively serve their client base, maintain their impact, and support ongoing relevance, they must demonstrate leadership in all aspects of their offerings. This course has been developed as a series of workshops covering several subjects pertinent to the common operations and management of non-profit organizations. The subject matter will include modules in such areas as communications, finance, governance, marketing, strategic planning, alliance building, social media and technology integration. The series will be moderated by a combination of SCORE counselors and subject matter experts (SME’s)
Electronic Workbook provided.
Printed Workbook available upon request for additional fee.

MARKETING USING ONLINE MARKETING -- FROM BOOSTS TO VIDEO
ZCAR 402 - 1119
Cost: $60
Sessions: 2-hours per class, Tuesday & Thursday evenings 6pm-8pm for 4 sessions (2 weeks) – October 29, 31, November 5 & 7

It’s no longer a want but a need to use online marketing for your business. This series of classes will look at the most innovative tools, tips, and techniques to take advantage of implementing online marketing for your business. During the eight-hour class (4 sessions for 2 hours), we will devote time to inform you about the changes happening in social media marketing. We will look at live video, pod-casting, watch parties, and groups. This will be the best 480 minutes you will devote to your business marketing.
Electronic Workbook provided, only

HOW TO START YOUR OWN BUSINESS
ZCAR 303 - 1119
Cost: $120
Sessions: 2-hours per class, Tuesday & Thursday evenings 6pm-8pm for 8 sessions (4 weeks) – October 1, 3, 8, 10, 15, 17, 22, & 24

According to a recent study by the Small Business Administration (SBA), in any given year about 7% of the U.S. working age population is actively engaged in efforts to start a business. This is the American dream. Many people aspire to become entrepreneurs but don’t know how or where to begin. Developed and taught by a panel of SCORE counselors and local business professionals with direct, small business experience, this workshop provides strategies and insights on how to get started and how to sustain commercial momentum. The curriculum for this course is designed to help the budding entrepreneur understand the practical aspects of basic business principles, vitally important to both start-up and newly established enterprises - organization, sales, marketing, accounting, finance, legal, insurance, social media, business buying/selling and business planning.
Electronic Workbook provided
Printed Workbook available upon request for additional fee.

Remember to register early!
Classes begin as indicated in agenda sections. See page 9 for instructions on how to register.
QUICKBOOKS ONLINE TRAINING & ACCOUNTING CONCEPTS
ZCAR 343 - 1119
Cost: $80
Sessions: 6 classes, 2-hours per class, Wednesday evenings 6pm-8pm and Saturday mornings 10am-12noon for 3 weeks – October 23 & 26, October 30 & November 2, & November 6 & 9
Additional $109.00 for printed Textbook, eBook & eLab license & Trial Software. Payable to Berks Schuylkill SCORE the first evening.

In this hands-on classroom format, students will learn the step-by-step processes to manage the bookkeeping and accounting functions for small businesses using QuickBooks Online. QuickBooks Online is the most popular US cloud-based accounting application for small to mid-sized businesses as it enhances collaboration with accounting professionals and remote workers, provides access from any Internet mobile device and integrates with a myriad of cloud-based applications that help business owners manage processes such as customer relationship management (CRM), inventory tracking, e-commerce, construction management and point of sales systems. This course will weave accounting concepts through each training segment in order to help students understand the accounting processes QuickBooks Online performs behind the scenes when entering common transactions. In addition, students will have real-world exercises to reinforce accounting concepts. Best practices for using QuickBooks Online and an emphasis on the underlying accounting principles will be highlighted in the class.

A PLAN FOR YOUR BUSINESS OR NONPROFIT
ZCAR 344 - 1119
Cost: $50
Sessions: 2 hours per class, Monday evenings 6:00pm-8:00pm for 3 weeks – November 11, 18, & 25

Planning is your guide through its growth. This threeweek hands-on course is a must for anyone starting a business or nonprofit, and/or buying, financing, or refinancing a small business. Taught by SCORE counselors, this step-by-step process will help you:
(1) move ideas from your head to paper in an organized, clear, and convincing manner;
(2) identify those key points that can make or break your chances of success;
(3) discover what critical points business lenders or private investors typically focus on; and
(4) avoid the most common mistakes in business planning and analysis.
Electronic Workbook provided. Printed Workbook available upon request for additional fee.

HOW TO REGISTER

BY MAIL: Visit www.racc.edu/Register.pdf and print out the Workforce and Economic Development/Community Education Registration Form. Mail to: Cashier’s Office, Reading Area Community College, P.O. Box 1706, Reading, PA 19603

BY PHONE: Call (610) 607-6235 or (610) 607-6231 to register with VISA, MasterCard or Discover.

IN PERSON: At Berks Hall, Room 107, RACC, 10 South 2nd Street, Reading, PA.
Monday and Thursday 8:00 am – 4:30 pm;
Tuesday and Wednesday 8:00 am – 7:00 pm; Friday 8:00 am – 4:30 pm.
VISA, MasterCard or Discover registration accepted.
Certificate and Degree Programs ................................................................. Page 11

**Launch your career**
- Smart Automation
- Robotics
- Information Technology, A+, CISCO Networking Academy®, Security, Industrial CCNA/IoT
- Machine Tool Technology
- Industrial Maintenance Technician, Mechatronics AAS
- Certified Production Technician (MSSC CPT)

**Individual Courses** ....................................................................................... Page 24

**Upgrade your current skills**
- Mechanical, Electrical, PLC, Robotics Labs

Certificate and Individual Courses ............................................................... Page 11

**Upgrade your Workforce - Flexible, affordable training**
- Pre-assessment Service - Technical Theory and Skills
- Certified Production Technician (MSSC CPT)
- Machine Tool Technology
- Mechanical, Electrical, PLC, Robotics Labs
- CISCO Security, Industrial CCNA/IoT
- Safety - OSHA, HAZWOPER

**Operational Excellence** ............................................................................... Page 40

**Improve Productivity**
- Lean, Supervisor, Engagement, Safety Training

Specialty Training.............................................................................................. Page 44

**Launch your career**
- Supply Chain/Transportation/Warehouseing Plant Technician
- Wastewater Treatment Plant Operator
- Electric Utility Technology (EUT)
- Ed2go On-line
What is Industry 4.0 (I4) Automation?

This is the 4th Revolution of Manufacturing since the industrial revolution began. Industry 4.0 is rapidly employing Artificial Intelligence (computer systems able to perform tasks that normally require human intelligence) to do the “labor” and “technology” needed to design, produce and distribute commodities and services.

Why learn/train/educate in I4 Smart Automation?

As humans accelerate the demand for faster delivery of services and products, the ease and safety of doing work and tasks and the multitude and modality of choices, manufacturers and businesses are compelled to hire tech-savvy employees with “mental” muscle and problem solving abilities to set-up, operate and maintain all aspects of smart manufacturing. Careers and jobs are in high demand, wages are family sustaining and the work is more meaningful.
ASSOCIATE 1

INTRODUCTION TO MECHATRONICS
Associate 1 – Entry-Level Operations - ZTEC 901
Investment: $1695
Hours: 65
Topics include:
- Introduction to Industry 4.0
- Safety
- Hand Tools
- Measurement
- Print Reading
- Precision Measurement
- Mechanical Drives
- Fluid Power
- AC/DC Electricity
- Electrical Relay Control
- Robotics Programming
- Electronic Sensors

ASSOCIATE 2

INTRODUCTION TO INDUSTRIAL CONTROL SYSTEMS
Associate 2 – Advanced Operations - ZTEC 902
Investment: $1695
Hours: 65
Topics include:
- Industry 4.0 Principles
- Mechanical Drives
- Pneumatics
- Robotics Programming
- Electrical Relay Control
- Electronic Sensors
- Ethernet Network Communications
- Programmable Controllers
- CNC Programming
- Mechatronic Systems

ASSOCIATE 3

INDUSTRIAL ROBOT PROGRAMMING & OPERATION WITH INTRO TO ROBOGUIDE/HANDLINGPRO AND ROBOT SIMULATION (FANUC LR MATE OR SCARA ROBOT)
Associate 3 – Entry-Level Robot Systems - ZTEC 903
Investment: $1695
Hours: 65
Topics include:
- Jogging The Robot
- Define Parts, Fixtures & End of Arm Tooling (EOAT)
- Teaching A Robot Program
- Matching Real Cell to Roboguide
- Electrical Relay Control
- Machines
- Importing and Exporting to and from the Robot
- Handling tool Operations & Programming
- Overview, Robotic Safety & Components
- Robot Software & Teach Pendants
- Introduction to Coordinate Systems and Robot Jogging
- Error Recovery and Motion Groups
- Frames
- Robotic Program Development
- Data Registers, Looping, Payload Schedule
- Robotic Inputs and Outputs (I/O) and Macros
- Program Adjust and File Manipulation

ASSOCIATE 4

INTRODUCTION TO THE INDUSTRIAL INTERNET OF THINGS (IIOT)
Associate 4 – Entry-Level Data Analytics and Networking - ZTEC 904
Investment: $1695
Hours: 65
Topics include:
- Advanced Programmable Controllers
- Data Analytics 1
- Variable Frequency Drives
- Bar Code Production Identification
- Mechatronics: Motors and Conveyers
- Ethernet Network 2
- RFID Product Identification
- Smart Sensors
- Programmable Controllers
- System Optimization
- Mechatronics: Communication & ASRS
- PLC Troubleshooting

ZTEC 900
Average time for course completion: 195 hours
Bundle Investment: $4,595 (when registering for all 4 Associate levels below)
Prepares for Smart Automation Certificate Alliance (SACA) Certified Industry 4.0 Associate (1-4) Certificates
INDUSTRY 4.0 SMART AUTOMATION PROGRAMS AND COURSES

INDUSTRY 4.0 SMART AUTOMATION MASTER TECHNICIAN

SMART AUTOMATION AND MECHATRONICS SYSTEM

ZTEC 906
Average time for course completion: 170 Hours
Investment: $4,295
- Automation Operations
- Basic Component Adjustments
- Pick and Place Feeding
- Gauging
- Indexing
- Sorting and Queuing
- Servo Robotic Assembly
- Torquing
- Parts Storage
- Electro-Hydraulic Testing
- Multiple Station Control
- Mechatronics Troubleshooting
- Intro to Industry 4.0
- Smart Communications – Ethernet/ Wireless
- Smart Identification – Barcodes & RFID
- Smart Sensors – Pneumatic Vacuum/ Ultrasonic/ Photoeye/ Electrical Current/ Analog Position/ Analog Pressure
- Smart Device – Stack Light
- Smart Vision Inspection
- Cloud Based Manufacturing Execution – Maintenance, Communication and Network Security (SQUEAKS AP)

Pre-requisite Courses or Equivalent Experience Needed:
- PLC Allen-Bradley Compactlogix L16 - ZTEC 454 (pg. 46)
- Mechatronics HMI Terminal - ZTEC 456 (pg. 46)

SUPERVISORS AND MANAGEMENT

INTRODUCTION TO SMART AUTOMATION AND INDUSTRIAL INTERNET OF THINGS (IIOT) - ZTEC 905
Average time for course completion: 65 Hours
Investment: $1,695

Topics include:
- Automation Operations
- Cloud Based Data Acquisition
- Programmable Logic Controller Operation (Allen-Bradley Micro820)
- Basic PLC Programming
- PLC Motor Control
- PLC Timer and Counter Instructions
- Pick and Place Feeding
- Smart Sensors
- PLC Event Sequencing
- Database Concepts
- Indexing
- Sorting and Parts Storage
- Automated Storage and Retrieval Systems

CISCO INTRODUCTION TO NETWORKS (CCNA 1)
ZCOM 413*
Average time for course completion: 90 Hours
Investment: $795 Textbook Additional

ROUTING AND SWITCHING ESSENTIALS (CCNA 2)
ZCOM 414*
Average time for course completion: 90 Hours
Investment: $975 Textbook Additional
*Completion of CCNA 1 & 2 prepares for Cisco CCENT Certification Exam (100-105)

CCNA SECURITY - ZCOM 408
Average time for course completion: 90 Hours
Investment: $975 Textbook Additional
Completion of CCNA Security prepares for Cisco Network Security Certification Exam (210-260)

CCNA IIoT (Industrial Internet of Things) - ZCOM 419
Average time for course completion: 90 Hours
Investment: $1,075 Textbook Additional
Completion of CCNA Security prepares for Cisco CCNA Industrial Exam (200-601)

See pages 17 & 18 for CISCO course descriptions.
INDUSTRY 4.0 SMART AUTOMATION
PROGRAMS AND COURSES

TECHNICIANS

MOTOMAN MERIT CERTIFIED
ROBOT FS100 BASIC PROGRAMMING
WITH MATERIAL HANDLING
ZTEC 556
Average time for course completion: 32 Hours
Investment: $1,925

This training is provided by RACC as a Motoman Merit Certified facility. The course is designed to help students learn to program and operate the FS100 Robot Controller using INFORM programming language (similar to the DX100).

• Safety
• Startup and Shutdown
• Pendant overview
• Jogging in all Coordinate Systems
• Copying, Creating, Deleting and Editing Jobs
• Alarm and Error Recovery,
• Programming and Monitoring Input/Output
• Using Math and Position Variables

FANUC INDUSTRIAL ROBOT
PROGRAMMING & OPERATION WITH
INTRO TO ROBOGUIDE/HANDLINGPRO
AND ROBOT SIMULATION
ZTEC 903
Average time for course completion: 65 Hours
Investment: $1,625

• Jogging The Robot
• Define Parts, Fixtures & End of Arm Tooling
• Teaching A Robot Program
• Matching Real Cell to Roboguide
• Electrical Relay Control
• Machines
• Importing and Exporting to and from the Robot
• Handling Tool Operations & Programming
• Overview, Robotic Safety & Components
• Robot Software & Teach Pendants
• Introduction to Coordinate Systems and Robot Jogging
• Error Recovery and Motion Groups
• Frames
• Robotic Program Development
• Data Registers, Looping, Payload Schedule
• Robotic Inputs and Outputs (I/O) and Macros
• Program Adjust and File Manipulation

SUPERVISORS AND MANAGEMENT

INTRO TO MOTOMAN FS100 BASIC
PROGRAMMING WITH MATERIAL HANDLING
ZTEC 559
Average time for course completion: 8 Hours
Investment: $375

Learn and understand the features of the FS100 Robot Controller and Programming Pendant using the INFORM programming language.

• Startup and Shutdown
• Tech Pendant Familiarization
• Pendant Screen
• Jogging and Coordinates
• Alarms and errors
• Selecting a Job
• Robot and Tool Path
• Non-Motion Instructions with Demonstration Program

INTRO TO FANUC® ROBOTS WITH
HANDLING TOOL SOFTWARE
ZTEC 554
Average time for course completion: 8 Hours
Investment: $275

• Robot Safety
• Robot Systems
• Teach Pendant Overview
• Power Up and Jogging
• Frames and Programs Overview
• Instruction Overview
• Inputs/Outputs
• Hands-on Labs and Quizzes
CERTIFICATE AND DEGREE PROGRAMS

<table>
<thead>
<tr>
<th>Job Prospects</th>
<th>Timeframe</th>
<th>Credential</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help Desk Support, Hardware Tech</td>
<td>6 months</td>
<td>Basic Skills Certificate</td>
<td>CompTIA A+ Certification IT Essentials, Fundamentals - ZCOM 336</td>
</tr>
<tr>
<td>IT Tech, Desktop Support</td>
<td></td>
<td>(2 NIMS)</td>
<td>IT Essentials, Advanced - ZCOM 337</td>
</tr>
<tr>
<td>Entry Level Network Tech Field Service Technician</td>
<td>6 months</td>
<td>Intermediate Skills</td>
<td>Cisco Networking Academy - CCENT Intro to Networks – ZCOM 413</td>
</tr>
<tr>
<td>NOC Technician</td>
<td></td>
<td>Certificate</td>
<td>Routing &amp; Switching Essentials – ZCOM 414</td>
</tr>
<tr>
<td>(preparation for small sized network operations)</td>
<td></td>
<td>(6 NIMS)</td>
<td></td>
</tr>
<tr>
<td>Intermediate Level Network Tech</td>
<td>CCENT +</td>
<td>CCNA Security</td>
<td>Cisco Networking Academy CCNA CCENT courses pluses Scaling networks –</td>
</tr>
<tr>
<td>Network Administrator, Network Engineer</td>
<td>6 months</td>
<td>4 months</td>
<td>ZCOM 415 Connecting Networks - ZCOM 416</td>
</tr>
<tr>
<td>(preparation for small to mid sized network operations)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Security</td>
<td>CCENT +</td>
<td>CCNA Security</td>
<td></td>
</tr>
<tr>
<td>Security Analyst, Network Admin, IT Security</td>
<td>4 months</td>
<td>(CCENT required)</td>
<td></td>
</tr>
<tr>
<td>Specialist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(your start to a career in Network &amp; Cyber Security)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MACHINE TOOL TECHNOLOGY

<table>
<thead>
<tr>
<th>Job Prospects</th>
<th>Timeframe</th>
<th>Credential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry Level CNC Machine Operator</td>
<td>6 months</td>
<td>Basic Skills Certificate 2 NIMS</td>
</tr>
<tr>
<td>Operator / Entry Level Manual Machinist</td>
<td>12 months</td>
<td>Intermediate Skills Certificate 6 NIMS</td>
</tr>
<tr>
<td>Entry Level CNC Programmer</td>
<td>18 months</td>
<td>Advanced Skills Certificate 3 NIMS</td>
</tr>
<tr>
<td>Machinist / CNC Programmer</td>
<td>24 months</td>
<td>Machine Tool Technology AAS 2 NIMS</td>
</tr>
</tbody>
</table>

INDUSTRIAL MAINTENANCE, MECHATRONIC, AAS

<table>
<thead>
<tr>
<th>Job Prospects</th>
<th>Credential</th>
<th>Timeframe</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paid Internship Entry Level Maintenance Tech</td>
<td>AMIST 1*</td>
<td>6 months</td>
<td>AMIST 1 • Industrial Mechanical • Industrial Electrical • Industrial PLC</td>
</tr>
<tr>
<td>Entry Level Maintenance Tech</td>
<td>Basic Skills Certificate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Maintenance Tech</td>
<td>AMIST 2*</td>
<td>18 months</td>
<td>AMIST 1 plus • Industrial Mechanical 2 • Industrial Electrical 2 • Industrial PLC2</td>
</tr>
<tr>
<td>(preparation for small sized network operations)</td>
<td>Intermediate Skills Certificate (plus experience)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Maintenance Tech Level 2</td>
<td>AMIST 3*</td>
<td>24 months</td>
<td>AMIST 1 &amp; 2 plus • Industrial Robots &amp; Motion Control • Advanced PLC • Process Control and Industrial Instrumentation</td>
</tr>
<tr>
<td>Industrial Engineering Tech &gt;&gt; AAS Degree</td>
<td>AMIST 4</td>
<td>&gt;24 months</td>
<td>ALL AMIST Certificates plus • Capstone Mechatronics Project • Manufacturing Fundamentals • General Education Requirements</td>
</tr>
<tr>
<td>Transfer credits to 4 year BS Program</td>
<td>Mechatronics, AAS with AMIST 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CompTIA A+

Course Description
The IT Essentials courses are designed for students who want to pursue careers in IT and students who want to gain practical knowledge of how a computer works. Students who complete these courses will be able to describe the internal components of a computer, assemble a computer system, install an operating system, and troubleshoot using system tools and diagnostic software. Students will also be able to connect to the Internet and share resources in a networked environment. Additional topics covered include laptops and portable devices, wireless connectivity and basic implementation skills, Voice over Internet Protocol (VoIP), security, safety and environmental issues, applied network configuration and troubleshooting skills, and communication skills. Hands-on lab activities are essential elements that are integrated into the curriculum. Labs are designed to supplement learning and provide hands-on experience with physical equipment. Now including Mac IOS and Linux basics with added emphasis on mobile and wireless technologies. Prerequisite: general knowledge of the use of a computer.

Aligns with 220-1001 & 220-1002 CompTIA A+ Certification exams

IT Essentials - Fundamentals
ZCOM-336 $1,650
Textbook additional fee. Includes test fee.
Approximate time to complete: 200 hours

IT Essentials - Advanced
ZCOM-337 $1,550
Includes test fee.
Prerequisite of ZCOM 336 (use book from ZCOM 336)
Approximate time to complete: 200 hours

Hands-on

A+ SERIES: IT ESSENTIALS
IT Essentials: PC Hardware and Software covers the fundamentals of PC computer technology, networking, and security, and also provides an introduction to advanced concepts. IT Essentials: PC Hardware and Software is a hands-on, e-learning solution with an emphasis on practical experience to help students develop fundamental computer skills along with essential career skills. This curriculum also helps students prepare for the CompTIA A+ certification.

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
CCNA Routing and Switching - CCENT

The Cisco CCNA Routing and Switching curriculum is designed for students seeking entry-level jobs in the Information and Communications Technology (ICT) industry or hoping to fulfill prerequisites to pursue more specialized ICT skills. The program provides an integrated and comprehensive coverage of networking topics, from fundamentals to advanced applications and services, while providing opportunities for hands-on practical experience and career skills development.

The program is composed of four courses. After the first two courses (Introduction to Networks and Routing & Switching Essentials), students will be prepared to sit for their CCENT® certification exam. At that point, students can continue their studies in other concentration areas including CCNA Routing and Switching® and CCNA Security®.

**INTRODUCTION TO NETWORKS (CCNA 1)**
ZCOM-413  
$795 for 90 hours  
Textbook additional fee.

This initial networking course introduces the architecture, structure, functions, components and models of the Internet and other computer networks. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. Students will be able to build simple LAN’s, perform basic configurations for routers and switches, and implement IP addressing schemes. This course also introduces students to the use of debugging and network troubleshooting.

**ROUTING AND SWITCHING ESSENTIALS (CCNA 2)**
ZCOM-414  
$975 for 90 hours  
Textbook additional fee.

This course describes the architecture, components, and operations of routers and switches in small to medium sized networks. Students learn how to configure routers and switches for basic functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches. Topics include LAN switching technologies and connecting LANs using static and dynamic routing protocols i.e. OSPF. Additionally, inter-VLAN routing methods are explained before learning to control and limit such access for added network security. Automated IP addressing, DHCP, is configured as well as Network Address Translation for IPv4. Additional IPv6 topics and configurations are also covered. New topics include Device Discovery for network mapping, Password Recovery and more. Prerequisite of ZCOM 413.

Successful completion of these two courses prepare students to sit for their CCENT® certification exam.  
(Aligns to Cisco certification exam 100-105)

* Reasonable eligibility restrictions apply for the grade-based vouchers, we do not offer a pre-paid voucher for the CCNA composite exam.

These courses have an open start date.  
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
CCNA Routing and Switching - CCNA

SCALING NETWORKS (CCNA 3)
ZCOM-415 $795 for 90 hours
Textbook additional fee.
This course describes the architecture, components, and operations of routers and switches in a larger and more complex network. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF (single & multi-area), EIGRP, STP, VTP, DTP, FHRP’s and more in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement WLAN’s in small to medium sized networks as well as the configuration and management of Cisco IOS images and licensing.

CONNECTING NETWORKS (CCNA 4)
ZCOM-416 $975 for 90 hours
Textbook additional fee.
Includes exam fee as pre-paid plus grade-based vouchers*. This course discusses the WAN technologies and network services required by converged applications in a complex network. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students will also develop the knowledge and skills needed to implement and troubleshoot GRE & IPSec VPN operations. Also expanded to BGP, LAN security, SPAN, SNMPv3 configuration, QoS, NetFlow, IPv6 ACL troubleshooting, Cloud Services, Virtualization, SDN network programming and more.

Successful completion of these two courses plus the CCENT® certification prepare students to sit for their CCNA® certification exam. (Aligns to Cisco certification exam 200-105)

CCNA Security

CCNA SECURITY
ZCOM-408 $1,275 for Approx. 90 hours
Textbook additional fee.
Includes exam fee as pre-paid plus grade-based vouchers*. 
Suggested Prerequisite: CCNA 1 and CCNA 2
Security and risk-management skills are among the most highly sought after skills in networking. Organizations around the world are experiencing a shortage of qualified IT candidates with the specialized knowledge and skills needed to administer devices and applications in a secure infrastructure, recognize network vulnerabilities, and mitigate security threats.

The Cisco Networking Academy® CCNA Security course provides a next step for individuals who want to enhance their CCENT-level skill set and help meet the growing demand for network security professionals.

CCNA IIoT

CCNA IIOT
ZCOM-419 $1,275 for Approx. 90 hours
The Cisco Network Associate Industrial (CCNA IIoT) certification is for plant administrators, control system engineers and traditional network engineers in the manufacturing, process control, and oil and gas industries, who will be involved with the convergence of IT and Industrial networks.

Topics Include:
- IP Networking
- Common Industrial Protocol (CIP) Knowledge and Configuration
- Profinet Knowledge and Configuration
- Security
- Wireless
- Troubleshooting

After completion of this course students can sit for the 200-601 IMINS2
Prerequisites: Industrial Networking Specialist or CCENT or CCNA Routing and Switching, or any valid CCIE certification

*Reasonable eligibility restrictions apply for the grade-based vouchers, we do not offer a pre-paid voucher for the CCNA composite exam.

These courses have an open start date.

Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
### Basic Skills Certificate

**BASIC CNC OPERATION**  
(Z)MTT-100 $3,295  
**150 hours**

**BASIC CNC LATHE OPERATION**  
(Z)MTT-101 $565  
Teaches basic set up and operation of CNC lathes. Preparation NIMS Level I certificate: CNC Lathe Operation. **Co-requisite: (Z)MTT-100**  
**30 hours**

### Intermediate Skills Certificate *(Basic Skills Certificate plus)*

**INTRODUCTION TO MACHINING**  
(Z)MTT-105 $1,695 (textbook additional)  
Theoretical and practical aspects of shop safety, hand tools, precision layout, precision measuring instruments, taps, dies, files, reamers, and identification and use of appropriate materials to manufacture parts are covered. Preparation for two NIMS Level I certifications: Measurement, Materials and Safety; Layout and Bench work.  
**75 hours**

**BASIC MACHINE TOOLS**  
(Z)MTT-110 $1,695 (textbook additional)  
Basic operations of the drill press, pedestal grinder and band saw will be covered. Preparation for the NIMS Level I certification: Drill Press.  
**75 hours**

**TURNING TECHNOLOGY LEVEL I**  
(Z)MTT-157 $1,695 (textbook additional)  
Knowledge, practical learning experience and accident prevention awareness required to perform conventional lathe job planning, set-up and operation. Aspects of conventional, carbide and other tooling materials selection, preparation, and usage will be covered. Preparation to take NIMS Level I certification: Turning between Centers and Chucking.  
**75 hours**

**MILLING TECHNOLOGY LEVEL I**  
(Z)MTT-158 $1,695 (textbook additional)  
Knowledge and skills necessary to identify and safely use various milling cutters and other tools that are adapted to milling machines. This course covers conventional milling machine parts and controls, the function of each part and control and techniques so that students can operate the machines safely and with a high degree of accuracy. Preparation to take the NIMS Level I certification: Milling.  
**75 hours**

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*Flexible start times available*

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**These courses have an open start date.**  
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
## Advanced Skills Certificate (Intermediate Skills Certificate plus)

<table>
<thead>
<tr>
<th>Course</th>
<th>Duration</th>
<th>Fee (textbook additional)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CNC PROGRAMMING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Z)MTT-180</td>
<td>75 hours</td>
<td>$1,695</td>
</tr>
<tr>
<td>Introduction to “G” and “M” code programming for Milling and Turning. Teaches theory designed to successfully start programming CNC Mills and Turning Centers. This program is recommended for the student who wants to further their knowledge in CNC Programming.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Duration</th>
<th>Fee (textbook additional)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAM PROGRAMMING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Z)MTT-288</td>
<td>75 hours</td>
<td>$1,695</td>
</tr>
<tr>
<td>Teaches skills of Computer Aided Manufacturing (CAM) programming using MasterCAM software. Students will learn how to create 2D mill, 3D mill and lathe part geometries and toolpaths. Students will also use the software to create CNC part programs and be able to verify their toolpaths.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Duration</th>
<th>Fee (textbook additional)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BLUEPRINT READING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Z)MTT-132</td>
<td>75 hours</td>
<td>$1,695</td>
</tr>
<tr>
<td>Teaches necessary skills to interpret part drawings. Emphasis will be placed on stimulating the students’ creativity and the ability to visualize the drawn object. This course will start with simple part drawings and advance to more complex part drawings.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Duration</th>
<th>Fee (textbook additional)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CNC MILL LEVEL I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Z)MTT-185</td>
<td>75 hours</td>
<td>$1,795</td>
</tr>
<tr>
<td>Teaches FANUC “G” and “M” code programming along with set-up and operation of CNC Milling Centers. Designed by FANUC to teach CNC Programming, Set-up and Operation for Machining Centers. Preparation for NIMS CNC Milling Level 1 Programming and Operation exam.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Duration</th>
<th>Fee (textbook additional)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TURNING TECHNOLOGY LEVEL II</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Z)MTT-225</td>
<td>75 hours</td>
<td>$1,695</td>
</tr>
<tr>
<td>Knowledge, practical learning experience and accident prevention awareness required to perform advanced conventional lathe job planning, set-up and operation. Aspects of conventional, carbide and other tooling materials selection, preparation, and usage will be covered. Preparation for NIMS Level II certification: Turning between Centers and Chucking.</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Duration</th>
<th>Fee (textbook additional)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENGINEERING GRAPHICS WITH SOLIDWORKS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Z)MTT-107</td>
<td>45 hours</td>
<td>$1,195</td>
</tr>
<tr>
<td>(no books, all online)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learn to use Solidworks to draw 3d part models, 2d part drawings, parametric parts, part assemblies and basic simulation. Exercises include sketching, extruding parts, editing parts, moving assemblies and SimulationXpress. Students will learn the foundational skills of Solidworks.</td>
<td></td>
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</tr>
</tbody>
</table>

**Flexible start times available**

These courses have an open start date. Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
## Machine Tool Technology AAS (Advanced Skills Certificate plus)

### MILLING TECHNOLOGY LEVEL II
(Z)MTT-212 $1,695 (textbook additional)
Knowledge and skills necessary to identify and safely use various milling cutters and other tools that are adaptable to milling machines. Students learn to set up work pieces to be properly machined. Preparation for NIMS Level II certification: Milling. 75 hours

### CNC MILLING II
(Z)MTT-272 $1,695 (textbook additional)
Designed by FANUC to teach FANUC MACRO Programming. Preparation for NIMS CNC Milling Level II Programming and Operation exam. 75 hours

### GRINDING TECHNOLOGY
(Z)MTT-221 $1,695 (textbook additional)
Teaches theoretical and the practical skills development in precision grinding operations. Students will learn to safely use a surface grinder, applying various techniques to make metal parts to blueprint specifications. Preparation for NIMS Level I & Level II certification in grinding. 75 hours

### ADVANCED CNC TURNING
(Z)MTT-276 $1,795 (textbook additional)
Designed by FANUC to teach “G” and “M” code programming along with setup and operation of CNC Turning Centers. Preparation for NIMS CNC Turning Level 1 Programming and Operation exam. 75 hours

### CNC FIXTURE DESIGN - CAD EXPERIENCE PREFERRED
(Z)MTT-265 $1,195 (textbook additional)
Teaches CAD software design of production ready jigs and fixtures. Design features and methods will be discussed. 45 hours

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These courses have an open start date. Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
Schmidt Training and Technology Center

UPGRADE YOUR SKILLS - FOUR MODERN TECHNOLOGY LABS

STUDENTS & EMPLOYERS

Mechanical Lab
LAB HOURS: M-F 7:30AM - 3:30PM
        M-TH 5PM - 9PM

Drives, Hydraulics, Pneumatics, Pumps, Piping, Rigging, Troubleshooting

Electrical Lab
LAB HOURS: M-F 7:30AM - 3:30PM
        M-TH 5PM - 9PM

AC/DC, Motors, Electronics, Sensors, Power Distribution, Troubleshooting

Schmidt Training and Technology Center Labs conveniently open Monday through Friday, accommodating both day and evening students.
UPGRADE YOUR SKILLS - FOUR MODERN TECHNOLOGY LABS

Studs and Employers

**Schmidt Training and Technology Center**

**UPGRADE YOUR SKILLS - FOUR MODERN TECHNOLOGY LABS**

**Schmidt Training and Technology Center Labs** conveniently open Monday through Friday, accommodating both day and evening students.

**PLC Networking Lab**
LAB HOURS: M-F 7:30AM - 3:30PM
M-TH 5PM - 9PM

Allen Bradley, Siemens, Process Control, Communication, Troubleshooting

**Smart Automation, Mechatronics and Robotics Lab**
LAB HOURS: M-F 7:30AM - 3:30PM
M-TH 5PM - 9PM

Programming, Process Control, Simulation, Communication, Troubleshooting
RACC’s Mechatronics/AМИST technical courses are offered in two instructional delivery/learning models:

- **Traditional** - All training, both theory and hands-on, conducted at the Schmidt Training and Technology Center.
- **Hybrid** - Theory accessed over the Internet with instructor support; hands-on skills taught and assessed at the Schmidt Training and Technology Center. Access to the Internet training site is 24 hours a day, seven days a week.

In both models, instructors with relevant industry experience are available to guide students through the program.

<table>
<thead>
<tr>
<th>AMIST 1</th>
<th>AMIST 2</th>
</tr>
</thead>
</table>
| **MET 120**  
Industrial Mechanical –  
Hydraulics Track  
ZTEC 356  
Approximately 162 hours of training, 5 college credits  
Investment: $4,485  
Traditional or Hybrid Learning  
- Hydraulics 1  
- Hydraulics 2  
- Pneumatics 1  
- Pneumatics Maintenance  
- Pneumatics Construction  
- Piping Systems  
- Hydraulic Troubleshooting  
- Basic Mechanical Drives  
- Light & Heavy Duty V-Belt and Chain Drives  
**OR**  
**MET 120**  
Industrial Mechanical –  
Pneumatics Track  
ZTEC 371  
Approximately 162 hours of training, 5 college credits  
Investment: $4,485  
Traditional or Hybrid Learning  
- Pneumatics 1  
- Pneumatics 2  
- Pneumatics Maintenance  
- Pneumatics Troubleshooting  
- Hydraulics 1  
- Piping Systems  
- Basic Mechanical Drives  
- Light & Heavy Duty V-Belt and Chain Drives  
**MET 130**  
Industrial Electrical  
ZTEC 227  
Approximately 120 hours of training, 4 college credits  
Investment: $3,215  
Traditional or Hybrid Learning  
- Electrical Control Circuits 1  
- Electrical Control Circuits 2  
- Electrical Motor Control 1  
- Electrical Motor Control 2  
- Electro-Fluid Power 1  
- Electronic Sensors  
- Residential/Commercial Wiring  
- Industrial Electrical Wiring  
- Industrial Power Distribution  
**MET 140-1**  
Industrial PLC (SLC500)  
ZTEC 428  
Approximately 80 hours of training, 2 college credits  
Investment: $2,025  
Traditional or Hybrid Learning  
- Introduction to PLC  
- Basic PLC Programming  
- PLC Motor Control  
- Discrete I/O Interfacing  
- Intro to PLC Troubleshooting  
- PLC Systems Troubleshooting  
- Event Sequencing  
- Application Development  
- Timer & Counter Instructions  
- Program Control Instructions  
- Math and Data Move Instructions  |
| **MET 150**  
Industrial Mechanical 2  
Hydraulics Track  
ZTEC 369  
Approximately 170 hours of training, 6 college credits  
Investment: $4,415  
Traditional or Hybrid Learning  
- Spur Gear & Multiple Shaft Drives  
- Belts, Lubrication, Shaft Alignment and Couplings  
- Mechanical Drives 3 & 4  
- Floor Standing Conveyors  
- Vibration Analysis  
- Laser Alignment  
- Central Lubrication  
- Pneumatic Directional Control Valves & Air Logic  
- Advanced Pneumatics  
- Pneumatic Troubleshooting  
**OR**  
**MET 150**  
Industrial Mechanical 2 -  
Pneumatics Track  
ZTEC 375  
Approximately 170 hours of training, 6 college credits  
Investment: $4,415  
Traditional or Hybrid Learning  
- Spur Gear & Multiple Shaft Drives  
- Synchronous Belt Drives  
- Lubrication Concepts  
- Precision Shaft Alignment  
- Couplings  
- Mechanical Drives 3 & 4  
- Floor Standing Conveyors  
- Vibration Analysis  
- Laser Alignment  
- Central Lubrication  
- Hydraulics 2  
- Hydraulic Troubleshooting  
**MET 160**  
Industrial Electrical 2  
ZTEC 242  
Approximately 115 hours of training, 3 college credits  
Investment: $2,255  
Traditional or Hybrid Learning  
- Basic Electrical Machines System  
- Advanced Electric Motor Controls  
- DC Electronic Drives  
- AC Electronic Drives  
**MET 140-2**  
Industrial PLC (SLC500) 2  
ZTEC 433  
Approximately 40 hours of training, 2 college credits  
Investment: $1,025  
Traditional Learning only  
- Analog Application System  
- Data Highway 485 System  
- Panelview Plus 6 DH-485 System w/ Keypad  
- Remote Input/Output  |

**OR** - pneumatics concentration preferred by food and pharmaceuticals manufacturing, hydraulics concentration preferred by general manufacturing

*These courses have an open start date.*  
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.

racc.edu
## AMIST 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Credits</th>
<th>Investment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 200</td>
<td>Industrial Robotics and Motion Control</td>
<td>Approximately 140</td>
<td>4</td>
<td>$4,215</td>
<td>Robotics &amp; Computer Programming, Flexible Manufacturing Systems, General Purpose Motion Control System, Multi-Axis Motion Control System</td>
</tr>
<tr>
<td>ZTEC 531</td>
<td></td>
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</tr>
</tbody>
</table>

**Advanced Industrial PLC - Your choice:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Credits</th>
<th>Investment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 220</td>
<td>Advanced Industrial PLC</td>
<td>Approximately 170</td>
<td>4</td>
<td>$3,995</td>
<td>PLC Controller and Troubleshooting Functions, Analog I/O Application System, Panelview Plus 1000 System, DeviceNet I/O Networking, ControlNet Networking, Ethernet/IP Networking</td>
</tr>
<tr>
<td>ZTEC 438</td>
<td></td>
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</tr>
</tbody>
</table>

- **OR**
  - MET 220 Advanced Industrial PLC Siemens S7-300
  - ZTEC 439
  - Approximately 140 hours of training, 4 college credits
  - Investment: $3,995
  - Controller & Troubleshooting Functions, Analog I/O Application System, Profinet Communications System, TP1200 Operator Panel (HMI), Remote Input/Output, Math and Data Move Instructions

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Credits</th>
<th>Investment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 210</td>
<td>Process Control &amp; Industrial Instrumentation</td>
<td>Approximately 90</td>
<td>3</td>
<td>$2,555</td>
<td>Pressure, Level, Flow, Heat &amp; Cooling</td>
</tr>
<tr>
<td>ZTEC 437</td>
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</tbody>
</table>

## AMIST 4

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Credits</th>
<th>Investment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 111</td>
<td>Manufacturing Fundamentals</td>
<td>Approximately 30</td>
<td>1</td>
<td>$565</td>
<td>Principles of Advanced Manufacturing, CNC, PLC and Automation, Manufacturing personnel and their responsibilities, Lean Manufacturing, Workplace Organization, Communication Skills, Importance of effective communication, Listening skills, and feedback, Safety Practices and Regulations, Basic workplace safety concepts and practices, Personal Protection Equipment, Importance of Personal Protective Equipment (PPE), Identify the potential hazards that require PPE, Types of PPE required for different types of hazards, The worker's role in following PPE guidelines and requirements</td>
</tr>
</tbody>
</table>

- **MET Courses Plus General Education Requirements**
  - *Gen Ed Courses AAS Degree 31 cr.*
  - ORI 103 College Success Strategies 3 cr.
  - MAT 160 College Algebra 3 cr.
  - MET 101 Intro to Shop Machinery 3 cr.
  - COM 121 or 122 English Composition 3 cr.
  - PHY 150 or 250 Applied Physics 4 cr.
  - IFT 110 Microcomputer Applications 3 cr.
  - SOC 130 Sociology 3 cr.
  - ENV 130 or 131 The Environment 3 cr.
  - COM 141 Technical Writing 3 cr.
  - HUM 100 Critical Thinking 3 cr.

These courses have an open start date. Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
SAVE THE DATE

SMART MANUFACTURING SUPPLY CHAIN AND BUSINESS SUMMIT

October 3, 2019
Schmidt Training and Technology Center

Keynote Speaker: Craig McAtee
Executive Director of the National Coalition of Advanced Technology Centers

Embrace the transition into the 4th Industrial Revolution

SMART Automation Demos:
- Smart Communications
- Smart Sensors
- Smart Devices
- Cloud Based Manufacturing Execution
- Robot Integration
- Cisco Internet of Things ... and more!

Industry 4.0 Workshops:
- Talent Strategies
- Optimization Tied to your Customer
- E-Commerce
- Network and Cyber Security
- SHAPE Diagnostic ... and more!
FLEXIBLE, CUSTOMIZED TRAINING SOLUTIONS

EMPLOYERS

Select the learning modules that directly impact your productivity initiatives.

ABC Manufacturing Inc. - Customized Training Plan
LAP 1 Introduction to Electric Motor Control
LAP 2 Manual Motor Control and Overload Protection
LAP 3 Control Transformers Control
LAP 4 Ladder Logic
LAP 5 Control Relays and Motor Starters
LAP 6 Introduction to Troubleshooting
LAP 7 System Troubleshooting
LAP 8 Reversing Motor Control
LAP 9 Automatic Input Devices
LAP 10 Basic Timer Control: On-Delay and Off-Delay

Page 34
ELECTRIC MOTOR CONTROL – ZTEC 207
LAP 1 Introduction to Electric Motor Control
LAP 2 Manual Motor Control and Overload Protection
LAP 3 Control Transformers Control
LAP 4 Ladder Logic
LAP 5 Control Relays and Motor Starters
LAP 6 Introduction to Troubleshooting
LAP 7 System Troubleshooting
LAP 8 Reversing Motor Control
LAP 9 Automatic Input Devices
LAP 10 Basic Timer Control: On-Delay and Off-Delay

Page 35
POWER & CONTROL ELECTRONICS – ZTEC 252
LAP 1 Oscilloscopes
LAP 2 Linear Power Supplies
LAP 3 Power Supply Filtration and Regulation
LAP 4 Solid State Relays
LAP 5 Discrete Sensing Devices
LAP 6 Thermal Sensing Devices
LAP 7 Amplifiers and Operational Amplifiers
LAP 8 Analog Sensing Devices
LAP 9 Solid State Switching
LAP 10 Solid State Speed and Power Control

Pre-Assessment Service
Technical Theory and Skills
Save time and resources! Pre-assess your employee’s technical theory and skills prior to program / course selections.

Align Employees’ Acquired Theory and Skills Knowledge to our:
• Maintenance Tech / AMIST Programs
• Machining / CNC Programming
• Mechanical / Electrical / PLC

Contact Christi Loverich at 610.372.4721 ext. 5305 or cloverich@racc.edu for pricing and details.

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
INDIVIDUAL COURSES
UPGRADE YOUR SKILLS - MANUFACTURING / TECHNICAL BASICS

Hand Tools, Safety, Quality

MECHANICAL FABRICATION
BASIC SKILLS – ZTEC 390
Average time for course completion: 32 hours
Investment: $595
LAP 1 Threaded Fasteners
LAP 2 Wrenches
LAP 3 Pneumatic System Fabrication
LAP 4 Screwdrivers
LAP 5 Pliers and Locking Devices
LAP 6 Mallets and Non-Threaded Fasteners
LAP 7 Torque Wrenches
LAP 8 Portable Power Tools

BLUEPRINT READING 1 – ZTEC 516
Average time for course completion: 12 hours
Investment: $275
LAP 1 Multiview Drawings
LAP 2 Sectional Drawings and Fasteners
LAP 3 Geometric Dimensioning and Tolerancing

MANUFACTURING PROCESSES – ZTEC 548
Average time for course completion: 36 hours
Investment: $1,035
Prerequisite: ability to read blueprints
LAP 1 Band Saw Operation
LAP 2 Intro to the Drill Press
LAP 3 Drill Press Operations
LAP 4 Intro to Manufacturing Hand Tools
LAP 5 Intro to the Manual Milling Machine
LAP 6 Milling Processes
LAP 7 Intro to the Manual Lathe
LAP 8 Turning Operations
LAP 9 Lathe Operations

QUALITY ASSURANCE – ZTEC 500
Average time for course completion: 44 hours
Investment: $1,199
Prerequisite: ability to read blueprints
LAP 1 Basic Measurement
LAP 2 Precision Measurement Tools
LAP 3 Dimensional Gauging
LAP 4 Introduction to Statistical Process Control (SPC)
LAP 5 Control Chart Operation
LAP 6 Control Chart Analysis
LAP 7 SPC Problem Solving
LAP 8 Geometric Dimensioning and Tolerancing
LAP 9 Location Tolerances
LAP 10 Orientation Tolerances
LAP 11 Form Tolerances

INTRODUCTION TO SHOP MACHINERY – ZTEC 558
Average time for course completion: 90 hours  3 college credits.
Investment: $2,385
• Quality Assurance
  – Basic Measurement, Precision Measurement, Dimensional Gauging
  – Introduction to SPC, SPC Problem Solving
  – Control Chart Operation, Control Chart Analysis
  – Geometric Dimensioning and Tolerancing
  – Location, Form and Orientation Tolerances
• Blueprint Reading
• Solid Drawing Modeling
  – Solid Model creation using Solidworks
  – Assembly creation using Solidworks
• Manual Machine Tools
  – Introduction to the Drill Press, Drill Press Operations
  – Introduction to the Milling Machine, Milling Operations
  – Introduction to the Manual Lathe, Lathe Operations
• OSHA 10-Hour General Industry Safety Course

MECHANICAL AND ELECTRICAL FABRICATION – MET 090
Average time for course completion: 45 hours
Investment: $795
LAP 1 Threaded Fasteners
LAP 2 Wrenches
LAP 3 Pneumatic System Fabrication
LAP 4 Screwdrivers
LAP 5 Pliers and Locking Devices
LAP 6 Mallets and Non-Threaded Fasteners
LAP 7 Torque Wrenches
LAP 8 Portable Power Tools
LAP 9 Electrical Systems
LAP 10 Residential Wiring System Components
LAP 11 Service Connections & Circuit Protection

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
INDIVIDUAL COURSES
UPGRADE YOUR SKILLS - MANUFACTURING / TECHNICAL BASICS

**Plastics**

**PRINCIPLES OF PLASTICS – ZPLS 801**
Average time for course completion: 5 hours
Investment: $75 - Online only - no skills

**Introduction to Plastics**
1. Plastics Making Process
2. Properties of Plastics
3. Plastics Manufacturing Processes
4. Plastics Nomenclature
5. Environmental Considerations

**PLASTICS TECHNOLOGY 1 – ZPLS 802**
Average time for course completion: 6 hours
Investment: $90 - Online only - no skills

**Intro To Injection Molding Operations**
1. Injection Molding Process
2. Molding: Material And Machine Safety
3. Molding Operations
4. Molding Problems And Solutions

**Basic Injection Mold Design**
1. Injection Mold Sprues And Runner Systems
2. Injection Mold Gates
3. Part Design - Shrinkage And Warpage
4. Injection Mold Vents

**Advanced Injection Molding**
1. Inserts In Injection Molds
2. Threads And Multiple-part Molds
3. Integral Hinges
4. System Purging

**PLASTICS TECHNOLOGY 2 – ZPLS 803**
Average time for course completion: 4 hours
Investment: $60 - Online only - no skills

**Introduction To Blow Molding Operations**
1. Blow Molding Process
2. Blow Molding Safety And Operation
3. Blow Molding Troubleshooting

**Basic Blow Molding Design**
1. Introduction To Blow Molds
2. Blow Mold Design
3. Blow Molding: Materials And Advanced Design

**Introduction To Extrusion Operations**
1. Extrusion Process
2. Extrusion Safety And Operation
3. Extrusion Troubleshooting

**Computer Aided Drafting (CAD)**

**AUTOCAD – ZMTT 310**
Average time for course completion: 36 hours
Investment: $825

For the new user who needs comprehensive training in AutoCAD, edit and publish drawings with AutoCAD. No previous CAD experience necessary. Drafting, design or engineering experience a plus.

**ENGINEERING GRAPHICS WITH SOLIDWORKS ZMTT 107**
Average time for course completion: 45 hours
Investment: $1,195

Learn to use Solidworks to draw 3D part models, 2D part drawings, parametric parts, part assemblies and basic simulation. Exercises include sketching, extruding parts, editing parts, moving assemblies and SimulationXpress. Students will learn the foundation skills of Solidworks.

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
CPT & CPT PLUS (PATHWAYS TO SUCCESSFUL CAREERS)
COMPREHENSIVE LEANING AND ASSESSMENT WITH SKILL BOSS

Increase employer and worker confidence by requiring evidence of hands on skills.

Designed to prepare employees with the next generation skills to work in a computer-driven, data-intensive advanced manufacturing workplace.

- CPT – Interactive, virtual 3-D simulation learning
- CPT Plus - 55+ "Hands-on" Skills and Assessment from MSSC National Standards with Skill Boss

Now Offering
CPT / CPT PLUS, PRE-APPRENTICESHIP BOOT CAMP*
ZTEC 645
Average time for course Completion: 195 hours
Investment - $1,600 (includes registration, CPT E-learning, Skill Boss Training, and 5 Assessments through CPT Plus Certification)

*Value Bundle
Bundling CPT Certification and CPT Plus Skills Assessment

Students suggested completion time 10-12 weeks after registration.

Certified Production Technician (CPT)
E-learning (Assessment and Certification options) - *See page 31 for language deliver and assessment / certification options
Average time for each module course Completion: 35 hours

Safety
Key Competencies Taught and Assessed:
- Perform safety and environmental inspections
- Perform emergency drills and participate in emergency teams
- Identify unsafe conditions and take corrective action
- Provide safety orientation for all employees
- Train personnel to use equipment safely

Quality Practices & Measurement
Key Competencies Taught and Assessed:
- Check calibration of gages and other data collection equipment
- Inspect materials and product/process, Suggest continuous improvements
- Document the results of quality tests
- Communicate quality problems.
- Take corrective actions to restore or maintain quality

Manufacturing Processes & Production
Key Competencies Taught and Assessed
- Identify customer needs
- Determine resources available for the production process
- Set up equipment for the production process
- Set team production goals, make job assignments
- Coordinate work flow with team members and other work groups
- Perform and monitor the process to make the product
- Document product and process compliance with customer requirements

Maintenance Awareness
Key Competencies Taught and Assessed
- Perform preventive maintenance and routine repair
- Monitor indicators to ensure correct operations
- Perform all housekeeping to maintain production schedule
- Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems with: Electrical, Pneumatic, Hydraulic, Machine automation systems; Lubrication processes; Bearings and couplings; Belts and chain drives
CPT & CPT Plus (Pathways to Successful Careers) 
Comprehensive Learning and Assessment with Skill Boss

Skill Boss, designed to meet MSSC standards, is a hands-on skill training & assessment system. CPT Plus certification proves successful demonstration of hand on skills in electronic, electrical, fluid power and mechanical systems.

CPT Plus* – Hands-on Training and Assessment
Average time for course Completion: 46 hours

Skill Boss Evaluates over 60 Essential Manufacturing Skills Including:
A. Safety
- Perform pre-start up inspection
- Demonstrate lockout/tagout procedure
- Confirm safety interlocks on guard are functional
- Confirm zero energy state of all power sources
- Locate and interpret safety data sheet(s)

B. Quality
- Perform measurements using tape measure, caliper, micrometer, & dial indicator
- Compare measurements to GDT specifications on a print
- Measure & verify shaft runout falls within specified tolerance

* Requires Full CPT Certification prior to registration.

C. Production Processes
- Locate parts & fasteners for assembly operation using a blueprint
- Assemble parts using Allen wrenches, wrenches, & screwdrivers
- Use torque wrench to properly tighten a fastener
- Navigate menus on an HMI
- Manually operate cylinders
- Perform an emergency shutdown
- Reset Alarm and restart machine
- Measure cycle time

D. Maintenance Awareness
- Adjust pneumatic lubricator’s drip rate
- Adjust pressure regulator’s setting
- Adjust actuator speed using flow control valves
- Install a pillow block bearing and shaft
- Install a flexible coupling and shaft
- Align and tension a belt drive
- Lubricate a bearing using a grease gun
- Drain an air filter
- Connect pneumatic circuit using a schematic
- Adjust various sensors.

MSSC E-learning Course

<table>
<thead>
<tr>
<th>Safety</th>
<th>Quality Practices &amp; Measurement</th>
<th>Manufacturing Processes &amp; Production</th>
<th>Maintenance Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZTEC 807 - English</td>
<td>ZTEC 808 - English</td>
<td>ZTEC 809 - English</td>
<td>ZTEC 810 - English</td>
</tr>
<tr>
<td>ZTEC 811 - Spanish</td>
<td>ZTEC 812 - Spanish</td>
<td>ZTEC 813 - Spanish</td>
<td>ZTEC 814 - Spanish</td>
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<tr>
<td>ZTEC 815 - Bilingual</td>
<td>ZTEC 816 - Bilingual</td>
<td>ZTEC 817 - Bilingual</td>
<td>ZTEC 818 - Bilingual</td>
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</tbody>
</table>

MSSC E-learning Course: Average Time for Course Completion: 35 hours
Investment - $165 per E-learning Course

E-learning only

CPT E-Learning with Certification / Per Course

<table>
<thead>
<tr>
<th>Safety</th>
<th>Quality Practices &amp; Measurement</th>
<th>Manufacturing Processes &amp; Production</th>
<th>Maintenance Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZTEC 641 - English only</td>
<td>ZTEC 642 - English only</td>
<td>ZTEC 643 - English only</td>
<td>ZTEC 644 - English only</td>
</tr>
<tr>
<td>Avg time : 7 hours, Investment $165</td>
<td>Avg time : 5 hours, Investment $120</td>
<td>Avg time : 15 hours, Investment $360</td>
<td>Avg time : 19 hours, Investment $455</td>
</tr>
</tbody>
</table>

Skill Boss - Skills only

CPT Plus
Skill Boss with Assessment

$205
Assessment for CPT Plus

See page 30 for 35% Bundle Savings

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
### Hydraulics

**BASIC HYDRAULICS – ZTEC 300**
- Average time for course completion: 20 hours
- Investment: $529
  - LAP 1: Hydraulic Power Systems
  - LAP 2: Basic Hydraulic Circuits
  - LAP 3: Principles of Hydraulic Pressure and Flow
  - LAP 4: Hydraulic Speed Control
  - LAP 5: Pressure Control Circuits

**INTERMEDIATE HYDRAULICS – ZTEC 301**
- Average time for course completion: 25 hours
- Investment: $609
  - LAP 1: Hydraulic DCV Applications
  - LAP 2: Hydraulic Cylinder Applications
  - LAP 3: Hydraulic Relief Valve Operation
  - LAP 4: Hydraulic Check Valve Applications
  - LAP 5: Accumulator Applications

**ADVANCED HYDRAULICS – ZTEC 302**
- Average time for course completion: 15 hours
- Investment: $359
  - LAP 1: Hydraulic Motor Applications
  - LAP 2: Hydraulic Pump and Motor Performance
  - LAP 3: Fluids and Conditioning

**HYDRAULIC TROUBLESHOOTING – ZTEC 308**
- Average time for course completion: 45 hours
- Investment: $1,115
  - LAP 1: Introduction to Pressure-Compensated Pumps
  - LAP 2: Pressure-Compensated Pump Performance
  - LAP 3: Troubleshooting Hydraulic Pumps
  - LAP 4: Troubleshooting Hydraulic Actuators
  - LAP 5: Troubleshooting Hydraulic DCVs
  - LAP 6: Troubleshooting Flow Control and Check Valves
  - LAP 7: Troubleshooting Pressure Control Valves
  - LAP 8: Troubleshooting Unloader and Counter balance Valves
  - LAP 9: Troubleshooting Hydraulic Systems

### Pneumatics

**BASIC PNEUMATICS – ZTEC 305**
- Average time for course completion: 16 hours
- Investment: $405
  - LAP 1: Pneumatic Power Systems
  - LAP 2: Basic Pneumatic Circuits
  - LAP 3: Principles of Pneumatic Pressure and Flow
  - LAP 4: Pneumatic Speed Control Circuits

**INTERMEDIATE PNEUMATICS – ZTEC 306**
- Average time for course completion: 15 hours
- Investment: $359
  - LAP 1: Pneumatic DCV Applications
  - LAP 2: Air Logic
  - LAP 3: Pneumatic Maintenance

**ADVANCED PNEUMATICS – ZTEC 307**
- Average time for course completion: 15 hours
- Investment: $359
  - LAP 1: Moving Loads Pneumatically
  - LAP 2: Vacuum Systems
  - LAP 3: Air Compressors

**PNEUMATIC TROUBLESHOOTING – ZTEC 309**
- Average time for course completion: 35 hours
- Investment: $869
  - LAP 1: Pneumatic Troubleshooting
  - LAP 2: Air Preparation Troubleshooting
  - LAP 3: Troubleshooting Pneumatic Cylinders
  - LAP 4: Motor & Rotary Actuator Troubleshooting
  - LAP 5: Troubleshooting DCV & Flow Control Valves
  - LAP 6: Troubleshooting Vacuum Systems
  - LAP 7: Troubleshooting Pneumatic Systems

**PNEUMATIC SYSTEM CONSTRUCTION – ZTEC 324**
- Average time for course completion: 4 hours
- Investment: $139

### Rigging

**RIGGING SYSTEMS 1 – ZTEC 357**
- Average time for course completion: 35 hours
- Investment: $809
  - LAP 1: Introduction to Rigging
  - LAP 2: Hoists
  - LAP 3: Slings and Lifting
  - LAP 4: Wire Rope
  - LAP 5: Chain Slings
  - LAP 6: Fiber Rope
  - LAP 7: Industrial Cranes

**RIGGING SYSTEMS 2 – ZTEC 358**
- Average time for course completion: 15 hours
- Investment: $359
  - LAP 1: Wire Mesh Slings
  - LAP 2: Synthetic Slings
  - LAP 3: Equipment Movement

### Lubrication

**CENTRAL LUBRICATION – ZTEC 318**
- Average time for course completion: 20 hours
- Investment: $455
  - LAP 1: Introduction to Central Lubrication
  - LAP 2: Lubrication Concepts
  - LAP 3: Simple Series/Progressive Lubrication System
  - LAP 4: Troubleshooting Series/Progressive Lubrication Systems
  - LAP 5: Piston Distributor Lubrication Systems

*These courses have an open start date.*

Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
INDIVIDUAL COURSES
UPGRADE YOUR SKILLS - MECHANICAL LAB

Drives

MECHANICAL DRIVES 1 – ZTEC 311
Average time for course completion: 35 hours
Investment: $869
LAP 1: Intro to Mechanical Drive Systems
LAP 2: Key Fasteners
LAP 3: Power Transmission Systems
LAP 4: Intro to V-Belt Drives
LAP 5: Intro to Chain Drives
LAP 6: Spur Gear Drives
LAP 7: Multiple Shaft Drives

MECHANICAL DRIVES 2 – ZTEC 312
Average time for course completion: 35 hours
Investment: $869
LAP 1: Heavy-Duty V-Belt Drives
LAP 2: V-Belt Selection and Maintenance
LAP 3: Synchronous Belt Drives
LAP 4: Lubrication Concepts
LAP 5: Precision Shaft Alignment
LAP 6: Couplings
LAP 7: Heavy-Duty Chain Drives

MECHANICAL DRIVES 3 – ZTEC 313
Average time for course completion: 35 hours
Investment: $869
LAP 1: Plain Bearings
LAP 2: Ball Bearings
LAP 3: Roller Bearings
LAP 4: Antifriction Bearing Selection and Maintenance
LAP 5: Gaskets and Seals
LAP 6: Advanced Gear Drives
LAP 7: Gear Drive Selection and Maintenance

MECHANICAL DRIVES 4 – ZTEC 314
Average time for course completion: 20 hours
Investment: $495
LAP 1: Brakes and Clutches
LAP 2: Brake/Clutch Selection and Maintenance
LAP 3: Linear Ball Bushings
LAP 4: Ball Screw Drives

FLOOR STANDING CONVEYORS – ZTEC 315
Average time for course completion: 4 hours
Investment: $139

VIBRATION ANALYSIS – ZTEC 316
Average time for course completion: 12 hours
Investment: $349
LAP 1: Intro to vibration analysis
LAP 2: Vibration condition monitoring
LAP 3: Vibration analysis

LASER ALIGNMENT – ZTEC 317
Average time for course completion: 8 hours
Investment: $239
LAP 1: Intro to laser shaft alignment
LAP 2: Laser shaft alignment operation

Pumps, Piping

PIPING SYSTEMS – ZTEC 310
Average time for course completion: 35 hours
Investment: $899
LAP 1: Metal Piping Systems
LAP 2: Metal Piping Installation
LAP 3: Plastic Piping Systems
LAP 4: Metal Tubing Systems
LAP 5: Hoses
LAP 6: Two-Way Valves
LAP 7: Check Valves and Sloan Valves

CENTRIFUGAL PUMP SYSTEMS – ZTEC 319
Average time for course completion: 20 hours
Investment: $505
LAP 1: Centrifugal Pump Operation
LAP 2: Centrifugal Pump Characteristics
LAP 3: Centrifugal Pump Troubleshooting
LAP 4: System Characteristics
LAP 5: Centrifugal Pump Performance

DIAPHRAGM PUMP – ZTEC 320
Average time for course completion: 4 hours
Investment: $139

PERISTALTIC PUMP – ZTEC 321
Average time for course completion: 4 hours
Investment: $139

MAGNETIC PUMP – ZTEC 322
Average time for course completion: 4 hours
Investment: $139

CENTRIFUGAL PUMP /STUFFING BOX – ZTEC 323
Average time for course completion: 4 hours
Investment: $139

MULTIPLE PUMP LEARNING SYSTEM – ZTEC 352
Average time for course completion: 4 hours
Investment: $139

GEAR PUMP – ZTEC 353
Average time for course completion: 4 hours
Investment: $139

PISTON PUMP – ZTEC 354
Average time for course completion: 4 hours
Investment: $139

TURBINE PUMP – ZTEC 372
Average time for course completion: 4 hours
Investment: $139

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
AC/DC ELECTRICAL SYSTEM – ZTEC 205
Average time for course completion: 30 hours
Investment: $729
LAP 1 Basic Electrical Circuits
LAP 2 Electrical Measurements
LAP 3 Circuit Analysis
LAP 4 Inductance and Capacitance
LAP 5 Combination Circuits
LAP 6 Transformers

ELECTRICAL RELAY CONTROL SYSTEMS – ZTEC 231
Average time for course completion: 15 hours
Investment: $359
LAP 1 Control Logic
LAP 2 Sequencing Control
LAP 3 Timers and Advanced Systems

ELECTRIC MOTOR CONTROL – ZTEC 207
Average time for course completion: 50 hours
Investment: $1,215
LAP 1 Introduction to Electric Motor Control
LAP 2 Manual Motor Control and Overload Protection
LAP 3 Control Transformers Control
LAP 4 Ladder Logic
LAP 5 Control Relays and Motor Starters
LAP 6 Introduction to Troubleshooting
LAP 7 System Troubleshooting
LAP 8 Reversing Motor Control
LAP 9 Automatic Input Devices
LAP 10 Basic Timer Control: On-Delay and Off-Delay

ADVANCED ELECTRIC MOTOR CONTROLS – ZTEC 208
Average time for course completion: 50 hours
Investment: $1,215
LAP 11 Motor Braking System
LAP 12 Reduced Voltage Starting Circuits
LAP 13 Power Generation and Distribution
LAP 14 Electronic Sensors
LAP 15 Timers and Counters
LAP 16 Variable Frequency AC Drive
LAP 17 Variable Frequency AC Drive, Speed & Torque Control
LAP 18 Variable Frequency Drives Acceleration, Deceleration, & Braking
LAP 19 Variable Frequency Drives Fault Diagnostics and Troubleshooting
LAP 20 SCR Speed Motor Control

ELECTRICAL CONTROL SYSTEM WIRING – ZTEC 209
Average time for course completion: 10 hours
Investment: $275
LAP 1 Introduction to Electrical Control Wiring
LAP 2 Electrical Control System Wiring

CONTROL PANEL WIRING – ZTEC 260
Average time for course completion: 15 hours
Investment: $359 (includes Allen Bradley and Siemens)
LAP 1 Introduction to Electrical Control Wiring
LAP 2 Electrical Control System Wiring

ELECTRICAL FABRICATION – ZTEC 253
Average time for course completion: 12 hours
Investment: $230
LAP 1 Introduction to Electrical System
LAP 2 Residential Wiring System Components
LAP 3 Service Connections and Circuit Protection

BASIC ELECTRICAL ROTATING MACHINES – ZTEC 206
Average time for course completion: 32 hours
Investment: $825
LAP 1 DC Series Motors
LAP 2 DC Shunt and Compound Motors
LAP 3 Motor Speed and Torque
LAP 4 Motor Performance
LAP 5 Split-Phase AC Motors
LAP 6 Capacitor-Start AC Motors
LAP 7 Permanent-Capacitor and Two-Capacitor Motors
LAP 8 Three-Phase AC Induction Motors

ROTATING ELECTRICAL MACHINES DC GENERATORS – ZTEC 250
Average time for course completion: 8 hours
Investment: $239
LAP 9 DC Generators
LAP 10 Wound-Rotor Motors

ROTATING ELECTRICAL MACHINES – ALTERNATORS/SYNCHRONOUS MOTORS – ZTEC 251
Average time for course completion: 12 hours
Investment: $349
LAP 11 Alternators
LAP 12 Alternator Synchronization Methods
LAP 13 Synchronous Motors

ELECTRICAL POWER DISTRIBUTION – ZTEC 210
Average time for course completion: 25 hours
Investment: $609
LAP 1 Introduction to Raceways
LAP 2 Basic Conduit Bending
LAP 3 Advanced Raceways
LAP 4 Conduit, Disconnects and Overcurrent Protection
LAP 5 Conduit Sizing and Wire Pulling Techniques

ELECTRO-FLUID POWER SYSTEM – ZTEC 303
Average time for course completion: 40 hours
Investment: $959
LAP 1 Introduction to Electrical Control Systems
LAP 2 Basic Control Devices
LAP 3 Power Devices
LAP 4 Control Relays
LAP 5 Sequencing Control
LAP 6 Timer Control
LAP 7 Pressure Control Applications
LAP 8 Circuit Applications

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
INDIVIDUAL COURSES
UPGRADE YOUR SKILLS - ELECTRICAL LAB

Electronics

POWER & CONTROL ELECTRONICS – ZTEC 252
Average time for course completion: 50 hours
Investment: $1,215
LAP 1 Oscilloscopes
LAP 2 Linear Power Supplies
LAP 3 Power Supply Filtration and Regulation
LPA 4 Solid State Relays
LAP 5 Discrete Sensing Devices
LAP 6 Thermal Sensing Devices
LAP 7 Amplifiers and Operational Amplifiers
LAP 8 Analog Sensing Devices
LAP 9 Solid State Switching
LAP 10 Solid State Speed and Power Control

AC ELECTRONIC DRIVES – ZTEC 400
Average time for course completion: 25 hours
Investment: $609
LAP 1 Introduction to AC Motion Control
LAP 2 AC Vector (Spindle) Drives
LAP 3 AC Axis Drives
LAP 4 General-Purpose AC Drives
LAP 5 AC Drive Troubleshooting

DC ELECTRONIC DRIVES – ZTEC 401
Average time for course completion: 30 hours
Investment: $729
LAP 1 Introduction to DC Motion Control
LAP 2 Basic DC Drives - SCR Control
LAP 3 DC Spindle Drives
LAP 4 DC Axis Drives
LAP 5 DC Pulse Width Modulation Drives
LAP 6 DC Drive Troubleshooting

ELECTRONIC SENSORS – ZTEC 304
Average time for course completion: 8 hours
Investment: $239
LAP 1 Introduction to Electronic Sensors
LAP 2 Electronic Sensor Applications

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
INDIVIDUAL COURSES
UPGRADE YOUR SKILLS - PLC LAB

Schmidt Training and Technology Center
racc.edu

Allen Bradley

PLC ALLEN BRADLEY SLC500 W/ TROUBLESHOOTING – ZTEC 402
Average time for course completion: 80 hours
Investment: $2,025
LAP 1 Introduction to Programmable Controllers
LAP 2 Basic PLC Programming
LAP 3 PLC Motor Control
LAP 4 Discrete I/O Interfacing
LAP 5 Introduction to PLC Troubleshooting
LAP 6 PLC Systems Troubleshooting
LAP 7 Event Sequencing
LAP 8 Application Development
LAP 9 PLC Timer Instructions
LAP 10 PLC Counter Instructions
LAP 11 Program Control Instructions
LAP 12 Math and Data Move Instructions

PLC ALLEN BRADLEY SLC500 ANALOG APPLICATION SYSTEM – ZTEC 403
Average time for course completion: 15 hours
Investment: $379
LAP 13 Analog Input Modules
LAP 14 Analog Output Modules
LAP 15 Analog Scaling

PLC ALLEN BRADLEY SLC500 DATA HIGHWAY 485 SYSTEM – ZTEC 404
Average time for course completion: 10 hours
Investment: $239
LAP 16 Introduction to DH-485
LAP 20 Remote I/O

PLC ALLEN BRADLEY SLC500 PANELVIEW PLUS 61 DH-485 SYSTEM W/ KEY PAD – ZTEC 405
Average time for course completion: 15 hours
Investment: $379
LAP 17 Introduction to Panelview
LAP 18 Panelview Application Editing 1
LAP 19 Panelview Application Editing 2

PLC ALLEN BRADLEY CONTROLLOGIX LEARNING SYSTEM WITH TROUBLESHOOTING – ZTEC 406
Average time for course completion: 80 hours
Investment: $2,025
LAP 1 Introduction to Programmable Controls
LAP 2 Basic PLC Programming
LAP 3 PLC Motor Control
LAP 4 Discrete I/O Interfacing
LAP 5 PLC Timer Instructions
LAP 6 PLC Counter Instructions
LAP 7 Introduction to PLC Troubleshooting
LAP 8 PLC Systems Troubleshooting
LAP 9 Event Sequencing
LAP 10 Application Development
LAP 11 Program Control Instructions
LAP 12 Math and Data Move Instructions

PLC ALLEN BRADLEY CONTROLLOGIX ANALOG INPUT/OUTPUT – ZTEC 407
Average time for course completion: 20 hours
Investment: $505
LAP 13 Analog Input Modules
LAP 14 Analog Input Configuration and Troubleshooting
LAP 15 Analog Output Modules
LAP 16 Analog Output Configuration and Troubleshooting

PLC ALLEN BRADLEY PANELVIEW PLUS LEARNING SYSTEM – ZTEC 408
Average time for course completion: 15 hours
Investment: $379
LAP 1 Introduction to Panelview Plus
LAP 2 Panelview Plus Application Editing 1
LAP 3 Panelview Plus Application Editing 2

PLC ALLEN BRADLEY CONTROLLOGIX ETHERNET – ZTEC 411
Average time for course completion: 25 hours
Investment: $525
LAP 1 Industrial Communications Networks
LAP 2 Remote Input/Output
LAP 3 Produced/Consumed Data and Messages
LAP 4 Troubleshooting EtherNet/IP

PLC ALLEN BRADLEY DEVICE NET FOR CONTROLLOGIX – ZTEC 429
Average time for course completion: 15 hours
Investment: $379
LAP 1 Industrial Communication Networks
LAP 2 DeviceNet Input/Output
LAP 3 DeviceNet Troubleshooting

PLC ALLEN BRADLEY CONTROLNET FOR CONTROLLOGIX – ZTEC 430
Average time for course completion: 15 hours
Investment: $379
LAP 1 Industrial Communications Networks
LAP 2 Remote Input/Output
LAP 3 Produced/Consumed Data and Messages

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
Allen Bradley (cont.)

**PLC ALLEN BRADLEY COMPACTLOGIX - L16**
**ZTEC 454**
Average time for course completion: 80 hours
Investment: $2,025
LAP 1  Introduction to Programmable Controllers
LAP 2  Basic PanelView Terminal Operation
LAP 3  PLC Program Operations
LAP 4  PLC Programming
LAP 5  PLC Motor Control
LAP 6  PLC Timer and Counter Instructions
LAP 7  Event Sequencing
LAP 8  Program Control Instructions
LAP 9  Math and Data Move Instructions
LAP 10 PanelView Plus Application Editing
LAP 11 PanelView Plus Application Editing 2
LAP 12 Analog Inputs
LAP 13 Analog Outputs
LAP 14 Variable Output Applications

**PLC TROUBLESHOOTING ALLEN BRADLEY COMPACTLOGIX - L16**
**ZTEC 455**
Average time for course completion: 20 hours
Investment: $505
LAP 1  Introduction to PLC Troubleshooting
LAP 2  PLC Systems Troubleshooting
LAP 3  Analog Input/Output Troubleshooting
LAP 4  Analog Application Troubleshooting

**MECHATRONICS HMI TERMINAL**
**ZTEC 456**
Average time for course completion: 15 Hours
Investment: $379
Basic HMI Panel Operation
HMI Application Editing
HMI Application Editing 2

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
# Fall 2019 Course Offerings

## Siemens

**PLC SIEMENS S7-300 LEARNING SYSTEM WITH TROUBLESHOOTING - ZTEC 412**
- Average time for course completion: 80 hours
- Investment: $2,025
  - LAP 1: Introduction to Programmable Controllers
  - LAP 2: Basic PLC Programming
  - LAP 3: PLC Motor Control
  - LAP 4: Discrete I/O Interfacing
  - LAP 5: PLC Timer Instructions
  - LAP 6: PLC Counter Instructions
  - LAP 7: Introduction to PLC Troubleshooting
  - LAP 8: PLC Systems Troubleshooting
  - LAP 9: Event Sequencing
  - LAP 10: Application Development
  - LAP 11: Program Control Instructions
  - LAP 12: Math and Data Move Instructions

**PLC ANALOG LEARNING SYSTEM SIEMENS S7-300 – ZTEC 413**
- Average time for course completion: 25 hours
- Investment: $525
  - LAP 13: Analog Input Modules
  - LAP 14: Analog Input Applications and Troubleshooting
  - LAP 15: Analog Output Modules
  - LAP 16: Analog Output Applications and Troubleshooting

**PLC PROFIBUS SYSTEM SIEMENS S7 – ZTEC 414**
- Average time for course completion: 15 hours
- Investment: $365
  - LAP 1: Industrial Comm Network (Siemens S7-300 Profibus)
  - LAP 2: Data Exchange

**PLC SIEMENS TP1200 OPERATOR PANEL LEARNING SYSTEM – ZTEC 415**
- Average time for course completion: 15 hours
- Investment: $379
  - LAP 1: Introduction to Siemens HMI Panel
  - LAP 2: Application Editing 1
  - LAP 3: Application Editing 2

**PLC SIEMENS S7-300 REMOTE I/O – ZTEC 444**
- Average time for course completion: 5 hours
- Investment: $139
  - LAP 1: Remote Input/Output

## Instrumentation and Process Control

**PROCESS CONTROL SYSTEM – ZTEC 416**
- Average time for course completion: 60 hours
- Investment: $1,425
  - LAP 1: Introduction to Process Control
  - LAP 2: Instrument Tags
  - LAP 3: Piping and Instrumentation Diagrams
  - LAP 4: Loop Controllers
  - LAP 5: Final Control Elements
  - LAP 6: Level Measurement
  - LAP 7: Liquid Level Control
  - LAP 8: Methods of Automatic Control
  - LAP 9: Basic Flow Measurement and Control
  - LAP 10: Control Loop Performance
  - LAP 11: Ultrasonic Level Measurement and Control
  - LAP 12: Differential Pressure Flow Measurement and Control

**THERMAL PROCESS CONTROL – ZTEC 417**
- Average time for course completion: 60 hours
- Investment: $1,425
  - LAP 1: Introduction to Process
  - LAP 2: Control Instrument Tags
  - LAP 3: Piping and Instrumentation Diagrams
  - LAP 4: Thermal Energy
  - LAP 5: Basic Temperature Control Elements
  - LAP 6: Loop Controllers
  - LAP 7: Final Control Elements
  - LAP 8: Temperature Sensors and Transmitters
  - LAP 9: Temperature Transmitters
  - LAP 10: Basic Temperature Control
  - LAP 11: Methods of Automatic Control
  - LAP 12: Control Loop Performance

**ANALYTICAL PROCESS CONTROL – ZTEC 432**
- Average time for course completion: 60 hours
- Investment: $1,205
  - LAP 1: Introduction to Process Control
  - LAP 2: Instrument Tags
  - LAP 3: Piping and Instrumentation Design
  - LAP 4: Introduction to Analytical Process Control
  - LAP 5: pH Electrodes
  - LAP 6: pH Meters and Transmitters
  - LAP 7: Loop Controllers
  - LAP 8: pH Control Systems
  - LAP 9: Methods of Automatic Control
  - LAP 10: Control Loop Performance

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These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
AUTOMATION has crossed into all plateaus of modern manufacturing. From raw materials to the finished product, manual labor has been replaced with robots, automatic equipment and computer networks, all in effort to produce items that are more accurately made and less costly to manufacture. The workforce needed to service these industries now and in the future will require additional skills.

The Flexible Manufacturing System builds on basic robot operation and programming and adds linear motion, serial communications and multitasking applications.

**FLEXIBLE MANUFACTURING SYSTEMS – ZTEC 510**
Average time for course completion: 50 hours
Investment: $1,375
- LAP 1 Intro to Flexible Manufacturing Systems
- LAP 2 Point-to-Point Assembly
- LAP 3 Linear Motion Assembly
- LAP 4 Palletizing
- LAP 5 Robot FMS Workcell
- LAP 6 Robot Communications
- LAP 7 Serial Device Applications
- LAP 8 Multitasking

**ROBOTICS AND COMPUTER PROGRAMMING – ZTEC 543**
Average time for course completion: 50 hours
Investment: $1,375
- LAP 1 Basic Robot Operation
- LAP 2 Basic Robot Programming
- LAP 3 Interfacing & Material Handling
- LAP 4 Application Development
- LAP 5 Flexible Manufacturing Cells
- LAP 6 Quality Control
- LAP 7 Production Control
- LAP 8 Workcell Development

**MOTION CONTROL (SERVO) LEARNING SYSTEM – ZTEC 520**
Average time for course completion: 36 hours
Investment: $1,155
- LAP 1 AC Motion Control
- LAP 2 Drive Configuration, Tuning and Operation
- LAP 3 Motion Control System Configuration
- LAP 4 Motion Control System Programming
- LAP 5 Position Control
- LAP 6 Velocity and Current Controls

**MOTION CONTROL (SERVO) LEARNING SYSTEM 2 – ZTEC 521**
Average time for course completion: 24 hours
Investment: $765
- LAP 1 Multi-Axis Motion Control Systems
- LAP 2 Motion Control Camming
- LAP 3 Synchronized Motion

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
OPERATIONAL EXCELLENCE
IMPROVING PRODUCTIVITY

Partnered with Nimble Leader
to Deliver Actionable Expertise

Tools for Profit™
A business framework and process that links what a business stands for in the minds of customers.

SHAPE
A catalyst for action to efficiently focus the attention and discussion of your management team to prioritize limited resources to achieve maximum gain.

Transforming the World of Work with Lean Workshops

- Introduction to Lean - Intro to Lean Principles
- Lean Enterprise Steering Team - Creating a roadmap for your lean journey
- Value Stream Management - Eight Steps to Planning, Mapping & Sustaining Lean Improvements
- Leader, Facilitator, and Coach - Continuous Improvement Change Agent
- 5S Workplace Organization - Five Pillars of the Visual Workplace
- Mixed Model Kanban - Lean Replenishment Technique for Pull Production
- Flow Cells - Continuous Flow - Flow for Work Teams
- Overall Equipment Effectiveness - Shop-floor Autonomous Maintenance
- Quick Changeover - The SMED System
- Root Cause and Corrective Action - Technicomp’s Corrective Action Program
- Kaizen for the Shop-floor - Continuous Improvement Event
- Lean Office - Eight Steps to Planning, Mapping & Sustaining Lean Improvements in administrative areas.

Our Workforce Development Team delivers custom training solutions that meet your needs. Contact Allison Creveling (610.607.6208, acreveling@racc.edu) or Mike Salute (msalute@racc.edu) for details.
Skill Building for Supervisors / Team Leads

We can deliver these Workshops at your facility, to meet the needs of your rotating shifts

**Skill Building for Supervisors / Team Leads**

**ZBUS - 440 - 6 hrs**
This 6 hour workshop presents supervisors and team leads with a series of recognized Best Practices to successfully coach and lead highly productive teams.

- Effective Coaching Techniques
- Effective Time Management Strategies
- Communication Skills; Giving and Receiving Constructive Feedback
- Understanding and Supervising Different Generations
- Conflict Management / Dealing with Difficult Behaviors

**SKILL BUILDING**
- Clarify objectives, plan for results
- Set-up group goals and priorities
- Identifying your personality style
- Communicate effectively to different personality types
- Be more assertive without being aggressive
- Understand behaviors that lead to conflict
- Quickly resolve conflict situations

Offered - 8:30am-3:30pm  $495
Contact us for scheduled Workshop dates.

**Conducting Performance Appraisals & Evaluations**
**ZBUS - 399 - 3 hrs**
Learn how to create an Evaluation & Appraisal meeting, how to measure exceeds, meets and needs improvement, how to tie your appraisal into organization goals, how to use the appraisal process daily, how to deal with the unexpected behaviors, being comfortable and confident in this process.

**Conflict Management & Dealing with Difficult Behaviors**
**ZBUS - 392 - 3 hrs**
Understand the thinking and behaviors that lead to conflict, identify new ways to communication in a conflict situation, establish a new process for conflict resolution, steps on how to deal with that angry person, techniques on how to manage different types of difficult people, stress management techniques.

**Understanding & Supervising Different Generations**
**ZBUS - 393 - 3 hrs**
Understand different generations; Old School, Baby Boomers, Gen X, Millennials, or Gen Y. Techniques to create a more productive workplace. Learn how to cope and communicate effectively with each generation. Techniques to motivate each generation.
### Leadership Development

**Strengthening the three pillars of leadership.**

**Designed for Supervisors / Team Leads**

**3 Skill Building Workshops with Clear, Relatable Implementation Tools**

<table>
<thead>
<tr>
<th>Awareness</th>
<th>Empowerment</th>
<th>Confidence</th>
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<tbody>
<tr>
<td>ZBUS - 442 - 3 hrs - $245</td>
<td>ZBUS - 443 - 3 hrs - $245</td>
<td>ZBUS - 444 - 3 hrs - $245</td>
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<tr>
<td>• Defining a good leader</td>
<td>• Leading as a coach</td>
<td>• Authentic Leadership - remaining true to yourself in difficult situations</td>
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<td>• Your role in the workplace</td>
<td>• The 5 languages of motivation</td>
<td>• Handling stress in the workplace</td>
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<td>• How do I rate now?, How do I improve? (assessment tool)</td>
<td>• Positive Reinforcement and Performance Management</td>
<td>• Managing Conflict with successful conflict resolution</td>
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<td>• The #1 skill needed to succeed</td>
<td>• Time management and goal setting</td>
<td>• Documentation Best Practices</td>
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<td>• Effective Communication</td>
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<td>• Communicating with difficult people</td>
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<td>• Team Building</td>
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**SKILL BUILDING TOOLS**

- Goal Setting Worksheets
- Ideal Leader
- Performance Management
- Skill Review Checklist
- Leadership Assessment

Take one as a refresher, take all three for a solid foundation in Leadership Development.

Offered to accommodate rotating shifts: 6 am – 9 am | 1 pm – 4 pm | 5 pm to 8 pm

Contact us for scheduled Workshop dates / times.

### Delivering Superior Customer Service

**ZBUS - 426 - 3 hrs**

Today, “servicing” your customer is not enough. If you want to delight and retain your valued customers (external and internal), you must consistently EXCEED their expectations.

No longer relegated to the “complaint department” or the “customer service department” - everyone who contacts customers must offer superior support and service. This high-energy seminar provides specific techniques to turn every employee into an ambassador, opening doors to future business.

Offered to accommodate rotating shifts: 6 am – 9 am | 1 pm – 4 pm | 5 pm to 8 pm

Contact us for scheduled Workshop dates / times.

### Training the Trainer

**ZBUS - 433 - 3 hrs**

New technologies have resulted in the “age of specialization”. Can your key employees “teach” the job they perform daily to your new hires? Stay competitive, productive and profitable by adopting results-driven training methodologies that engage the adult learner.

Our Workforce Development Team delivers custom training solutions that meet your needs. Contact Allison Creveling (610.607.6208, acreveling@racc.edu) or Mike Salute (msalute@racc.edu) for details.

Emergency Response Preparedness

Industrial Fire Brigade, Basic
Provides basic incipient level fire training for general employee groups, or dedicated incipient level fire brigades. Course covers chemistry of fire, hose and nozzles, fire streams, portable fire extinguishers, automatic systems, and live fire fighting exercises on incipient level fires with extinguishers and small hose streams.

Industrial Fire Brigade, Extended
Provides fire brigade training per the OSHA Guidelines. Course covers or refreshes all items covered in the Basic Fire Brigade Training Program, plus self-contained breathing apparatus, ropes and knots, ladders, search and rescue practices, and interior structural fire fighting exercises.

Fire Extinguishers
Prepares employees to properly and safely react to a fire in their work place. Trains new employees or refreshes current employees in their fire safety responsibilities. Topics covered: basic fire prevention, evacuation, extinguisher selection and use.

Hazardous Materials Awareness (HAZWOPER)
Recognize the presence of a hazardous material/WMD and to call for trained personnel to assist, secure and protect the area. This course will meet the requirement for annual review under 29 CFR 1910.120 for emergency response.

Hazardous Materials Operations (HAZWOPER)
Comply with Operations Level training identified in the NFPA 472 Core Competencies and in the Hazardous Materials Waste Operations and Emergency Response regulations.

Hazardous Materials Technician (HAZWOPER)
Recognize the presence of a hazardous material or WMD, select applicable decontamination procedures, and control a release using specialized protective clothing and control equipment and meet the competencies at the awareness and operations level.

Certified Bookkeeper
The Certified Bookkeeper Online Training Program helps professional bookkeepers earn prestigious American Institute of Professional Bookkeepers (AIPB) certification. 340 HRS

Grant Writing + Non-Profit Management
In this program, you will learn how to write a grant proposal, how to supervise employees, as well as the liabilities that non-profits encounter. 600 HRS

Home Inspection Certificate
Learn about standards of practice, defects recognition, inspection guidelines, reporting methodologies, and liability management as you prepare to become a home inspector. 200 HRS

Human Resources Professional
Master the skills you need to gain an entry-level position in human resources and prepare to take the PHR (Professional in Human Resources) certification exam. 120 HRS

Paralegal (Voucher Included)
In this program you will prepare you to become a legal secretary or paralegal and to take the Certified Paralegal certification exam. 300 HRS

Web Applications Developer
Master the skills you need to create dynamic database-driven websites using the latest technologies. 380 HRS

HVAC/R Certified Technician (Voucher Included)
Through hands-on simulations and in-depth course material, you will strengthen your understanding of HVAC/R service, repair, and maintenance. You will also learn about sustainable technology, environmental challenges, and their solutions, industry advancements, and develop customer-facing professional skills. 162 HRS

To Enroll or learn more visit - https://careertraining.ed2go.com/readingacc/training-programs
MECHANICAL TRAINING

**MECHANICAL DRIVES 1 – ZTEC 311**
Average time for course completion: 35 hours
Investment: $869
LAP 1: Intro to Mechanical Drive Systems
LAP 2: Key Fasteners
LAP 3: Power Transmission Systems
LAP 4: Intro to V-Belt Drives
LAP 5: Intro to Chain Drives
LAP 6: Spur Gear Drives
LAP 7: Multiple Shaft Drives

**MECHANICAL DRIVES 2 – ZTEC 312**
Average time for course completion: 35 hours
Investment: $869
LAP 1: Heavy-Duty V-Belt Drives
LAP 2: V-Belt Selection and Maintenance
LAP 3: Synchronous Belt Drives
LAP 4: Lubrication Concepts
LAP 5: Precision Shaft Alignment
LAP 6: Couplings
LAP 7: Heavy-Duty Chain Drives

**BASIC HYDRAULICS – ZTEC 300**
Average time for course completion: 20 hours
Investment: $529
LAP 1: Hydraulic Power Systems
LAP 2: Basic Hydraulic Circuits
LAP 3: Principles of Hydraulic Pressure and Flow
LAP 4: Hydraulic Speed Control
LAP 5: Pressure Control Circuits

**INTERMEDIATE HYDRAULICS – ZTEC 301**
Average time for course completion: 25 hours
Investment: $609
LAP 1: Hydraulic DCV Applications
LAP 2: Hydraulic Cylinder Applications
LAP 3: Hydraulic Relief Valve Operation
LAP 4: Hydraulic Check Valve Applications
LAP 5: Accumulator Applications

**HYDRAULIC TROUBLESHOOTING – ZTEC 308**
Average time for course completion: 45 hours
Investment: $1,115
LAP 1: Introduction to Pressure-Compensated Pumps
LAP 2: Pressure-Compensated Pump Performance
LAP 3: Troubleshooting Hydraulic Pumps
LAP 4: Troubleshooting Hydraulic Actuators
LAP 5: Troubleshooting Hydraulic DCVs
LAP 6: Troubleshooting Flow Control and Check Valves
LAP 7: Troubleshooting Pressure Control Valves
LAP 8: Troubleshooting Unloader and Counter Balance Valves
LAP 9: Troubleshooting Hydraulic Systems

**BASIC PNEUMATICS – ZTEC 305**
Average time for course completion: 16 hours
Investment: $405
LAP 1: Pneumatic Power Systems
LAP 2: Basic Pneumatic Circuits
LAP 3: Principles of Pneumatic Pressure and Flow
LAP 4: Pneumatic Speed Control Circuits

**INTERMEDIATE PNEUMATICS – ZTEC 306**
Average time for course completion: 15 hours
Investment: $359
LAP 1: Pneumatic DCV Applications
LAP 2: Air Logic
LAP 3: Pneumatic Maintenance

**PNEUMATIC TROUBLESHOOTING – ZTEC 309**
Average time for course completion: 35 hours
Investment: $869
LAP 1: Pneumatic Troubleshooting
LAP 2: Air Preparation Troubleshooting
LAP 3: Troubleshooting Pneumatic Cylinders
LAP 4: Motor & Rotary Actuator Troubleshooting
LAP 5: Troubleshooting DCV & Flow Control Valves
LAP 6: Troubleshooting Vacuum Systems
LAP 7: Troubleshooting Pneumatic Systems

**FLOOR STANDING CONVEYORS – ZTEC 315**
Average time for course completion: 4 hours
Investment: $139

**VIBRATION ANALYSIS – ZTEC 316**
Average time for course completion: 12 hours
Investment: $349
LAP 1: Intro to vibration analysis
LAP 2: Vibration condition monitoring
LAP 3: Vibration analysis

*These courses have an open start date. Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.*
**SUPPLY CHAIN/ WAREHOUSING PLANT TECHNICIAN**

**SPECIALTY**

**MACHINERY MOVING TRAINING**

**RIGGING SYSTEMS 1 – ZTEC 357**
Average time for course completion: 35 hours
Investment: $809
LAP 1  Introduction to Rigging
LAP 2  Hoists
LAP 3  Slings and Lifting
LAP 4  Wire Rope
LAP 5  Chain Slings
LAP 6  Fiber Rope
LAP 7  Industrial Cranes

**RIGGING SYSTEMS 2 – ZTEC 358**
Average time for course completion: 15 hours
Investment: $359
LAP 1  Wire Mesh Slings
LAP 2  Synthetic Slings
LAP 3  Equipment Movement

**ELECTRICAL & ELECTRONICS TRAINING**

**AC/DC ELECTRICAL SYSTEM – ZTEC 205**
Average time for course completion: 30 hours
Investment: $729
LAP 1  Basic Electrical Circuits
LAP 2  Electrical Measurements
LAP 3  Circuit Analysis
LAP 4  Inductance and Capacitance
LAP 5  Combination Circuits
LAP 6  Transformers

**ELECTRICAL RELAY CONTROL SYSTEMS – ZTEC 231**
Average time for course completion: 15 hours
Investment: $359
LAP 1  Control Logic
LAP 2  Sequencing Control
LAP 3  Timers and Advanced Systems

**ELECTRIC MOTOR CONTROL – ZTEC 207**
Average time for course completion: 50 hours
Investment: $1,215
LAP 1  Introduction to Electric Motor Control
LAP 2  Manual Motor Control and Overload Protection
LAP 3  Control Transformers Control
LAP 4  Ladder Logic
LAP 5  Control Relays and Motor Starters
LAP 6  Introduction to Troubleshooting
LAP 7  System Troubleshooting
LAP 8  Reversing Motor Control
LAP 9  Automatic Input Devices
LAP 10  Basic Timer Control: On-Delay and Off-Delay

**ELECTRICAL POWER DISTRIBUTION – ZTEC 210**
Average time for course completion: 25 hours
Investment: $609
LAP 1  Introduction to Raceways
LAP 2  Basic Conduit Bending
LAP 3  Advanced Raceways
LAP 4  Conductors, Disconnects and Overcurrent Protection
LAP 5  Conduit Sizing and Wire Pulling Techniques

**ELECTRICAL CONTROL SYSTEM WIRING – ZTEC 209**
Average time for course completion: 10 hours
Investment: $275
LAP 1  Introduction to Electrical Control Wiring
LAP 2  Electrical Control System Wiring

**ADVANCED ELECTRIC MOTOR CONTROLS – ZTEC 208**
Average time for course completion: 50 hours
Investment: $1,215
LAP 11  Motor Braking System
LAP 12  Reduced Voltage Starting Circuits
LAP 13  Power Generation and Distribution
LAP 14  Electronic Sensors
LAP 15  Timers and Counters
LAP 16  Variable Frequency AC Drive
LAP 17  Variable Frequency AC Drive, Speed & Torque Control
LAP 18  Variable Frequency Drives Acceleration, Deceleration, & Braking
LAP 19  Variable Frequency Drives Fault Diagnostics and TS
LAP 20  SCR Speed Motor Control

**AC ELECTRONIC DRIVES – ZTEC 400**
Average time for course completion: 25 hours
Investment: $609
LAP 1  Introduction to AC Motion Control
LAP 2  AC Vector (Spindle) Drives
LAP 3  AC Axis Drives
LAP 4  General-Purpose AC Drives
LAP 5  AC Drive Troubleshooting

**DC ELECTRONIC DRIVES – ZTEC 401**
Average time for course completion: 30 hours
Investment: $729
LAP 1  Introduction to DC Motion Control
LAP 2  Basic DC Drives - SCR Control
LAP 3  DC Spindle Drives
LAP 4  DC Axis Drives
LAP 5  DC Pulse Width Modulation Drives
LAP 6  DC Drive Troubleshooting

These courses have an open start date. Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
SUPPLY CHAIN/ WAREHOUSING PLANT TECHNICIAN

CONTROLS & SMART AUTOMATION TRAINING

SUPPLY CHAIN/ WAREHOUSING PLANT TECHNICIAN

PLC ALLEN BRADLEY COMPACTLOGIX - L16 - ZTEC 454
Average time for course completion: 80 hours
Investment: $2,025
LAP 1 - Introduction to Programmable Controllers
LAP 2 - Basic PanelView Terminal Operation
LAP 3 - PLC Program Operations
LAP 4 - PLC Programming
LAP 5 - PLC Motor Control
LAP 6 - PLC Timer and Counter Instructions
LAP 7 - Event Sequencing
LAP 8 - Program Control Instructions
LAP 9 - Math and Data Move Instructions
LAP 10 - PanelView Plus Application Editing
LAP 11 - PanelView Plus Application Editing 2
LAP 12 - Analog Inputs
LAP 13 - Analog Outputs
LAP 14 - Variable Output Applications

SMART AUTOMATION AND MECHATRONICS SYSTEM
- ZTEC 906
Average time for course completion: 170 Hours
Investment: $4,295
TOPICS INCLUDE:
- Automation Operations
- Basic Component Adjustments
- Pick and Place Feeding
- Gauging
- Indexing
- Sorting and Queuing
- Servo Robotic Assembly
- Torquing
- Parts Storage
- Electro-Hydraulic Testing
- Multiple Station Control
- Mechatronics Troubleshooting
- Intro to Industry 4.0
- Smart Communications – Ethernet/Wireless
- Smart Identification – Barcodes & RFID
- Smart Sensors – Pneumatic Vacuum/Ultrasonic/ Photoeye/
- Electrical Current/ Analog Position/ Analog Pressure
- Smart Device – Stack Light
- Smart Vision Inspection
- Cloud Based Manufacturing Execution – Maintenance,
Communication and Network Security (SQUEAKS AP)

MECHATRONICS HMI TERMINAL - ZTEC 456
Average time for course completion: 15 Hours
Investment: $379
Basic HMI Panel Operation
HMI Application Editing
HMI Application Editing 2

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
What’s Your Goal?
Join the field of Wastewater Treatment as a Plant Operator? Obtain your certification as a licensed plant operator? Earn continuing education units to maintain an existing certification? If so, then RACC’s Wastewater Treatment Plant Operator Program can help you reach your goal.

We Help You Get There With . . .
- Instructors who are certified operators and/or subject-matter experts
- Engaging classroom experiences
- Field trips to better understand treatment processes
- Access to DEP Exams in Fall & Spring

Program Description
RACC offers a 180-hour certification program designed to prepare new operators for licensing in the high demand field of wastewater treatment plant operators. The program curriculum was developed by the Pennsylvania Department of Environmental Protection (DEP) to prepare for the DEP’s Operator Certification Exams. Combining this program with work at a local treatment facility will prepare participants for licensing.

How You Will Learn
This program combines course work with onsite visits to local WWT facilities, plus interactive class discussion with certified operators, out of class assignments, and module end exams.

Career Outlook
- Wastewater Operators are in demand as current workforce nearing retirement age
- 6,000 employed across PA in 2017*
- 410 job openings every year in PA.*
- Competitive Salary Range $28,950* - $69,900*

Admission Requirements
- Be a graduate of an approved secondary school or hold a equivalency diploma (GED®).
- Have a commitment to attendance policies, program requirements, academic honesty policy and student responsibilities.

Currently Working in Wastewater Treatment and Having Trouble Passing Certification
- You can take any program component for $285
- Email Allison Creveling at acreveling@racc.edu or call 610.607.6208

Want To Learn More?
Contact Allison Creveling at acreveling@racc.edu or call 610.607.6208.

Register On-line
www.racc.edu/academics/course-registration-course-catalogs
1. Select the “Register and Pay for Community Education Classes” link.
2. Select the drop-down box “Topic Code”, select Business and click “Submit”.
3. Select ZWTR 120 and/or ZWTR 121 and click the “Submit” button.
4. Verify your class and payment, then select REGISTER NOW and complete credit card information.

Cost for the full 180-hour certification program for program year 2019-20 is $2,750. The second half of the program includes a scholarship opportunity. Cost for each 18-hour component is $285.
First Energy Lineman and Substation - Associate Degree Program

What’s Your Goal?
If your goal is to start or improve your career in the electric utility field as an Electrical Line or Substation Worker, then completion of RACC’s Electric Utility Technology Associate of Applied Science degree is a great place to start.

We Help You Get There With . . .
- Lecture class sizes of 33 students or fewer
- Engaging classroom experiences
- Hands-on training
- Learner-focused faculty

Program Description
This program is offered in partnership with FirstEnergy. Students gain knowledge and skills in AC/DC electricity, electrical circuits, electrical control wiring, wiring systems, transformers, power generation and power distribution. In addition to classroom and laboratory instruction, students also participate in hands-on training at a local FirstEnergy electric utility company training facility.

Enrollment in the program is restricted by a selection process conducted by FirstEnergy and employment for graduates with FirstEnergy is not guaranteed.

Career Outlook
Electrical Line and Substation Workers are in high demand with an expected increase of 15% in employment in Pennsylvania from 2012 to 2022 and 190 job openings every year in the state.

What You Will Learn
- The OSHA safety guidelines for the electric utility industry.
- The operation of equipment used in the maintenance and repair of electric utility systems.
- The experience and knowledge needed for a Commercial Drivers License (CDL).
- The skills to work on above-ground and underground circuits and de-energized and energized circuits

Admission Requirements
- Be a graduate of an approved secondary school or hold a high school equivalency diploma (GED®).
- Complete and submit the RACC Application for Admission.
- Students must complete a placement test to assess writing and math levels. If you have completed a college level Math and or English course with a C- or better at another institution, please submit your college transcript to RACC as soon as possible. Additional coursework may be required before the June selection deadline.

Course Completion Information
- Students must be accepted into FirstEnergy’s Power Systems Institute program and meet the following additional requirements in order to be considered for the program: Technical Evaluation, Physical Capabilities Assessment, Background Check, DOT Medical Examiner’s Certificate, Potential Drug Test, Qualifying School and an Interview.
- The number of students who can be accepted into FirstEnergy’s Power Systems Institute is limited due to operational staffing needs.

Please call Debbie Hettinger at 610.372.4721, ext. 5130 for additional information on this program.
ABE/HEP/ESL LITERACY PROGRAMS

Everyone who successfully meets the scoring requirements established by the state of Pennsylvania will receive a High School Equivalency Diploma from the Department of Education. This diploma is accepted, by law, as a legitimate high school diploma by business, industry, colleges, and most branches of the armed services.

**Note to previous test takers:** If you have passed part of the GED® test between January 1, 2002 and December 31, 2013, you may be eligible to receive credit for those sections. You will need to create an account at www.MyGED.com. One of the questions during registration asks, “Did you take any sections of the 2002 Series GED® test in Pennsylvania between 1/1/2002 and 12/31/13?” If you respond “yes,” the reply alerts you that the Pennsylvania Department of Education will verify your prior test score(s) and notify you by email with the sections of the 2002 Series GED® that you will be credited and not have to retake with the 2014 test.

Literacy Programs Information Center Hours

**Monday through Friday**

8:00 a.m. - 4:00 p.m.

**Literacy Programs Information Center**

**Contact Information:**

610.372.4721, Ext. 5322

GED® TRANSCRIPT INFORMATION

Individuals who have passed the GED® test may request a transcript through DiplomaSender. Visit diplomasender.com, create an account, request documents (electronic or paper)

Effective October 1, 2016, all Pennsylvania high school equivalency diplomas and transcripts for the GED® test will be handled by DiplomaSender.

Initial diploma and transcript will continue to be free. All documents are $15.00 per document. Documents include: transcripts, duplicate diplomas and letters of verification.

To prepare a student for the General Educational Development (GED®) test of high school equivalency, Reading Area Community College offers preparation classes, free of charge, to adults in our community. These classes meet both days and evenings at different locations throughout the county. An annual graduation is held in late Spring. Tutors are available to help students achieve success in their classwork.

GED® TEST

The GED® test is administered at Reading Area Community College through Pearson Vue testing. Pennsylvania residents (adults 18 years and older, as well as 16- and 17-year-old participants meeting specific qualifications) are eligible to take the computerized exam. All registrations, testing times, locations and payment with credit card are completed at the website gedtestingservice.com. Payment is required at the time of registration.

To earn a GED®, candidates must demonstrate a specific level of competency in the following four content areas:

- Reasoning Through Language Arts
- Mathematical Reasoning
- Science
- Social Studies

Please call 610.372.4721, Ext. 5322 for additional information about literacy programs.
LET YOUR FREE HOURS MAKE A DIFFERENCE IN SOMEONE’S LIFE!

Volunteer tutors are needed at Reading Area Community College for students taking classes in Adult Basic Education (ABE), General Education Development (GED) or English for Speakers of Other Languages (ESL). Are you interested?

QUALIFICATIONS
Volunteer tutors in RACC’s Adult Literacy Program must have a minimum of a bachelor’s degree.

TRAINING AND SUPPORT
As a volunteer tutor, you will receive a tutor orientation seminar that introduces you to the Adult Literacy Program at RACC, along with providing you with materials and tips. We offer an extensive library of books, and other educational materials for your use.

OPPORTUNITIES
There are several ways you can help. You may choose to tutor an individual student. A small group of students, or you may be a classroom aide. Our students are eager to learn and are very appreciative of your encouragement and support.

HOW CAN YOU BECOME A TUTOR?
Please call the Adult Literacy Program, Reading Area Community College at 610-372-4721 ext. 5155 or 5156. A Tutor Coordinator will be in touch with you to provide you more information about the program and answer any questions you may have about becoming a volunteer tutor.

HERE’S WHAT SOME OF OUR TUTORS HAD TO SAY:

“I learn more from my students than they may learn from me!
(This is the best unpaid job I ever had!”

“We tutors learn as well as the students! I find it so rewarding—that’s why I come back, year after year, after year!”

“Through being a volunteer tutor, doors have been opened that have allowed me to communicate with people that otherwise I would never have had the opportunity to meet.

Please call 610.372.4721, Ext. 5322 for additional information about literacy programs.
Associate Degree and Certificate (Credit) Programs

HOW DO I GET STARTED?

Stop by the Welcome Center in Berks Hall or complete the online application for admission at racc.edu. Whether you have questions about specific classes or programs or you are ready to enroll in classes, Enrollment Coordinators are available to help you every step of the way.

Welcome Center Hours of Operation:
Mondays 8 am-5 pm
Tuesdays 8 am-7:30 pm
Wednesdays 8 am-7:30 pm
Thursdays 8 am-5 pm
Fridays 8 am-5 pm

Or call 610.607.6224

COLLEGE CREDITS FOR LIFE EXPERIENCE
Did you know that you may be able to turn life experiences and professional knowledge into college credit? To learn more, call the Welcome Center at 610.607.6224.

For more information and to view the Admissions Event calendar, go to racc.edu/AdmissionsEvents.

Associate Degrees and Certificates

- Accounting –Also fully Online!
- Addictions Studies/Human Services
- Administrative Office Specialist
- Art
- Bookkeeping
- Business Administration –Also fully Online!
- Business Management
- Communications
- Computer Information Systems
- Computer Technology –Also fully Online!
- Creative Writing
- Criminal Justice/Law Enforcement
- Cyber Defense - Also fully Online!
- Early Childhood Programs
- Early Childhood Teaching (PreK-Grade 4)
- Electric Utility Technology
- Elementary Education (Grades 4-8)
- Engineering
- Fine Arts
- General Science
- General Studies –Also fully Online!
- Health Sciences
- Liberal Arts
- Machine Tool Technology
- Mechatronics Engineering Technology
- Medical Coding and Billing Specialist
- Medical Laboratory Technician
- Medical Office/Health Records Specialist
- Nanoscience Technology
- Network Support Specialist
- Nursing
- Occupational Therapy Assistant*
- Physical Therapist Assistant*
- Practical Nursing
- Psychology –Also fully Online!
- Respiratory Care
- Science
- Secondary Education
- Social Science –Also fully Online!
- Social Work –Also fully Online!
- Technology Studies
- Web Site Development

*Offered in cooperation with Lehigh Carbon

Please call an Enrollment Coordinator at 610.607.6224 for additional information on these programs.
Community Education Registration

Enroll immediately in the classes you want!
The online registration system saves you time and postage costs and is available at your convenience.

- Go to racc.edu/academics/course-registration-course-catalogs
  - Select the “Register and Pay for Community Education Classes” link in order to search for a class.
  - **EASY SEARCH:** Select only the drop-down box next to “Topic Code” to find the class for which you would like to register and click “Submit”.
  - **Select the course** that you wish to register for and click the “Submit” button.
  - Enter your information and click “Submit”.
  - **Proceed through the next several registration screens entering the required information and submitting at end of each screen.**
  - **Verify your class and payment, then select REGISTER NOW and complete credit card information.**
  - **You will receive a printable confirmation when the transaction is complete.**

For questions about the registration process, call 610.607.6235.

Remember to register early! Classes begin as indicated in course schedules found in this brochure.

To register:
- **By Mail:**
  - Visit racc.edu/academics/course-registration-course-catalogs and print out the Workforce and Economic Development/Community Education Registration Form.
- **By Phone:**
  - Call 610.607.6235 or 610.607.6231 to register with VISA, MasterCard or Discover.
- **In Person:**
  - At Berks Hall, Room 107, RACC, 10 South 2nd Street, Reading, PA. Monday and Thursday 8:00 AM–4:30 PM; Tuesday and Wednesday 8:00 AM–7:00 PM; Friday 8:00 AM–4:30 PM.

VISA, MasterCard or Discover registration accepted.

CLASS LOCATIONS: Reading Area Community College (RACC)
If the College withdraws a course, your tuition will be refunded. Instructor substitutions may be made in emergencies and at the discretion of RACC. Written refund requests must be received one week before classes begin. No refunds will be issued after this date. Please allow 4–6 weeks for a refund. Students must be 18 years old to register for adult classes.

REGISTRATION FORM
(to be used for all Community Education programs)

Please Print

<table>
<thead>
<tr>
<th>Date __________________________</th>
<th>RACC ID # __________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name/Company Name __________________________</td>
<td>SS #/Birthdate __________________________</td>
</tr>
<tr>
<td>Home/Company Address __________________________</td>
<td>City __________________________</td>
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<tr>
<td>Home Phone __________________________</td>
<td>Work Phone __________________________</td>
</tr>
<tr>
<td>Signature of Registrant __________________________</td>
<td></td>
</tr>
</tbody>
</table>

The following information will be used for the sole purpose of providing statistical data to the Federal government. This information will not be used for admission purposes.

Ethnicity:  
- [ ] Hispanic  
- [ ] Non-Hispanic/Non-Latino  
- [ ] Native Hawaiian/Other Pacific Islander

Race:  
- [ ] American Indian/Alaskan Native  
- [ ] Black/African-American  
- [ ] White  
- [ ] Asian

Section No __________________________ Title __________________________
Section No __________________________ Title __________________________
Section No __________________________ Title __________________________

Read course descriptions carefully. Written refund requests must be received one week before classes begin. No refunds will be issued after this date. Tuition must be paid at the time of registration.

MAIL TO:  Cashier’s Office, Reading Area Community College, P.O. Box 1706, Reading, PA 19603

Amount Enclosed $ __________________________ DO NOT SEND CASH. Make check payable to Reading Area Community College.

[ ] VISA  [ ] MasterCard  [ ] Discover Card

No. __________________________ Exp. Date _________ 3 Digit Code _________

Authorized Signature ____________________________________________

This form may be duplicated for additional registrations.
RACC offers hybrid (combined face-to-face and online) and traditional classes during the late afternoon to early evening hours Monday through Thursday at our additional location. To see available course offerings, visit racc.edu/sinkingspring or call 610.607.6224.

This spring, take your RACC courses in **Sinking Spring**!

RACC offers hybrid (combined face-to-face and online) and traditional classes during the late afternoon to early evening hours Monday through Thursday at our additional location.

To see available course offerings, visit racc.edu/sinkingspring or call 610.607.6224.

Look inside for Fall Course Offerings!

Looking for an entry-level, direct-hire job in manufacturing, with good pay and benefits?
Are you having trouble checking the boxes that ask about prior certification, training or experience?

Free 6-Week Manufacturing Skills Building Program

RACC is offering a 6-week skills building program, designed and endorsed by local employers to give you the training you need to qualify for an interview.

For more information and application for the Basic Manufacturing Skills Program:

- Send Text Message “EZSKILLS” to 474747
- Go to Schmidt Training and Technology Center Blog @ RACC.edu
- Contact Sarah at 610.372.4721 Ext. 5312 or sstapleton@racc.edu

*Supports Manufacturing Skill Standards Council’s Certified Production Technician Plus certification. An industry-led standards-based training, assessment and certification system focused on the core skills and knowledge needed by the nation’s advanced manufacturing workforce.