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

SPRING 2021
racc.edu
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.

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. 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.
Healthcare Programs

DENTAL ASSISTANT*

624.5 Hrs. $6,125
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
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 sit for the Pennsylvania State Competency Exam.

MEDICAL 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 health-care 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

VETERINARY ASSISTANT*
160 Hrs.  $1,700
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.

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

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

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!
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 include:

To register online follow instructions on page 52 and select topic code Insurance. Classes begin every six weeks!

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

Classes begin every six weeks!

MEDICAL INSURANCE AND BILLING CLASSES

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 Health 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-601  $345
3:10–5:10 PM  MW

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.

SIMCHART
ZINS-607  $345
10:10–12:10 PM  TTh

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/RA, 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).

MEDICAL INSURANCE AND CODING 2*
ZINS-606  $400
3:10–5:10 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.

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 52 and select topic code CPR

Please call 610.607.6220 for additional information on these programs.
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 or email CPR@racc.edu for information on scheduling an instructor course.

Please call 610.607.6220 for additional information on these programs.
Business

CAREER TRAINING

ADMINISTRATIVE ASSISTANT  $6,520*
656 Hrs. (6 months)  Classes begin every 6 weeks
This program prepares those possessing three to five years of business and/or clerical experience to upgrade to the administrative assistant level. Upon completion, the student will be prepared to work as an office manager, administrative assistant or executive secretary. Students complete a 200-hour internship.
For gainful employment visit https://goo.gl/qZacQs

COMPUTER APPLICATIONS  $3,330
231 Hrs. (3 months)  Classes begin every 6 weeks
This program will assist those students who need to gain valuable computer software training. Included in this course are classes in word processing and spreadsheets, along with keyboarding to increase speed. Students will also become proficient in Desktop Publishing, Access and PowerPoint.

OFFICE ASSISTANT WITH COMPUTER APPLICATIONS  $5,830*
558 Hrs. (6 months)  Classes begin every 6 weeks
This program is designed to build basic clerical skills with an emphasis on developing computer application skills. Students will be prepared to enter the business world as clerical support personnel, receptionists, correspondence clerks and data entry clerks. Students complete a 150-hour internship.
For gainful employment visit https://goo.gl/iUw2NV

Train for a new career in 6 months!

*Funding may be available through financial aid and/or scholarships.

*NOTE: A criminal background check is required for all courses with internships.
Please call 610.375.8188 for additional information on these programs.

BECOME A CERTIFIED 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

MARCH 8, 2021
Cost: $3,800
Please call 610.375.8188 for more information.
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 I*

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 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.

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Schmidt Training and Technology Center

A Safer Way to Learn

100% Remote - 100% Real

The technical courses listed are taught 1 on 1 student to STTC instructor utilizing a variety of remote learning tools: online simulators, electronic PDF’s, charts, designs, activities, diagrams, exercises, Canvas LMS, home edition software and 1 on 1 student to instructor dialog.

**MECHANICAL**

**Detailed course descriptions: page 32**

**ZTEC 305 – Basic Pneumatics**
This course uses an online simulator, electronic PDFs, charts, diagrams, designs, activities and 1 on 1 student to instructor dialog

**ZTEC 300 – Basic Hydraulics**
This course uses an online simulator, electronic PDFs, charts, diagrams, designs, activities and 1 on 1 student to instructor dialog

**MACHINE TOOL**

**Detailed course descriptions: pages 17, 19, 25, & 28**

**MET 111 or ZTEC 561 Manufacturing Fundamentals**
This course uses electronic PDFs, a safety activity and 1 on 1 student to instructor dialog

**(Z)MTT-132 Blueprint Reading**
This course uses exercises and questions in the Canvas LMS and 1 on 1 student to instructor dialog

**(Z)MTT-288 CAM Programming**
This course has uses Mastercam current Home Learning Edition software, electronic activities, exercises and and 1 on 1 student to instructor dialog

**ZTEC-516 Blueprint Reading**
This course uses online activities and exercises and and 1 on 1 student to instructor dialog

**ELECTRICAL**

**Detailed course descriptions: pages 24, 34, & 35**

**MET 130 or or ZTEC 227 – Industrial Electrical 1**
This course uses an online simulator, electronic PDFs and 1 on 1 student to instructor dialog

**ZTEC 205 – AC/DC Electrical Systems**
This course uses an online simulator, electronic PDFs and 1 on 1 student to instructor dialog

**ZTEC 206 – Electrical Machines Systems/ Rotating Machines**
This course uses electronic charts, diagrams, designs and 1 on 1 student to instructor dialog

**ZTEC 207 – Electrical Motor Control**
This course uses an online simulator, electronic PDFs, charts, diagrams, designs and 1 on 1 student to instructor dialog

**ZTEC 209 – Electrical Control Wiring**
This course is uses electronic PDFs and 1 on 1 student to instructor dialog

**ZTEC 210 – Electrical Power Distribution**
This course is uses electronic PDFs and 1 on 1 student to instructor dialog

**ZTEC 231 – Electrical Relay Control**
This course uses an online simulator, PDFs and 1 on 1 student to instructor dialog

**ZTEC 304 – Electronic Sensors**
This course uses electronic PDFs and 1 on 1 student to instructor dialog

**ZTEC 303 – Electro Fluid Power**
This course uses electronic PDFs, charts, diagrams, designs and 1 on 1 student to instructor dialog

**ZTEC 253 – Electrical Fabrication**
This course uses electronic PDFs and 1 on 1 student to instructor dialog

**STTC Technical Courses Remote Learning with Skills Validation at Plant**

Employees complete theory, quizzes and virtual skills online

STTC Instructors provide Company Supervisors with platform skills/checklists that the employee performs on plant equipment to validate competency.

Contact Bonnie Spayd bspayd@racc.edu
610-607-6207 office 484-256-8800 cell
Students

Certificate and Degree Programs ................................................................. Page 11

Launch your career
• Smart Automation
• Robotics
• Information Technology, A+, CISCO Networking Academy®, Security, Industrial CCNA/IIoT
• Machine Tool Technology
• Industrial Maintenance Technician, Mechatronics AAS
• Certified Production Technician (MSSC CPT) (page 30)

Individual Courses .......................................................................................... Page 28

Upgrade your current skills
• Mechanical, Electrical, PLC, Robotics Labs

Employers

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
• Industrial Network Internet of Things/IIoT
• Safety - OSHA, HAZWOPER

C-Suite Strategy & Operational Excellence .................................................. Page 40

Improve Productivity
• Supervisor, Engagement, Safety Training

Specialty Training

Launch your career
• Supply Chain/Transportation/Warehouseing Plant Technician
• Wastewater Treatment Plant Operator
• Electric Utility Technology (EUT)
• Ed2go On-line

racc.edu
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.
INDUSTRY 4.0 SMART AUTOMATION OPERATOR TECHNICIAN

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

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

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
• Hydraulics Fluid Power
• Pneumatics
• Robotics Programming
• Electrical Relay Control

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 Conveyors
• Ethernet Network 2
• RFID Product Identification
• Smart Sensors
• Programmable Controllers
• System Optimization
• Mechatronics: Communication & ASRS
• PLC Troubleshooting
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)

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

SWITCHING, ROUTING, AND WIRELESS ESSENTIALS
ZCOM 414*
Average time for course completion: 90 Hours
Investment: $795 Textbook Additional

ENTERPRISE NETWORKING, SECURITY AND AUTOMATION
ZCOM 416*
Average time for course completion: 90 Hours
Investment: $1,095 (INCLUDES TEST VOUCHER)

* See pages 17 for CISCO course descriptions.

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
Schmidt Training and Technology Center

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

FANUC INDUSTRIAL ROBOT PROGRAMMING & OPERATION WITH INTRO TO ROBOGUIDE/HANDLING-PRO 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: $375

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

racc.edu
## CERTIFICATE AND DEGREE PROGRAMS

### JOB PROSPECTS TIMEFRAME CREDENTIAL

<table>
<thead>
<tr>
<th>Job Prospects</th>
<th>Timeframe</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help Desk Support, Hardware Tech IT Tech, Desktop Support</td>
<td>6 months</td>
<td>CompTIA A+ Certification IT Essentials, Fundamentals - ZCOM 336 IT Essentials, Advanced - ZCOM 337</td>
</tr>
<tr>
<td>Entry Level Network Tech Field Service Technician, NOC Technician</td>
<td>6 months</td>
<td>A+ Certificate, Intro to Networks ZCOM 413, Switching, Routing and Wireless Essentials - ZCOM 414</td>
</tr>
<tr>
<td>System Administrator, Network Engineer/Technicians, Help Desk Engineer, Sales Engineer</td>
<td>8 months</td>
<td>CCNA 7.0 Intro to Networks ZCOM 413, Switching,Routing and Wireless Essentials - ZCOM 414</td>
</tr>
</tbody>
</table>

### MACHINE TOOL TECHNOLOGY

**PAGES 19-21**

<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 CNC Operation ZMTT 100, BASIC CNC LATHE OPERATION ZMTT 105</td>
</tr>
<tr>
<td>Operator / Entry Level Manual Machinist</td>
<td>6-12 months</td>
<td>Precision Machining Levels 1 &amp; 2</td>
</tr>
<tr>
<td>Entry Level CNC Programmer</td>
<td>18 months</td>
<td>CNC Precision Specialty Certificate</td>
</tr>
<tr>
<td>Machinist / CNC Programmer</td>
<td>24 months</td>
<td>Machine Tool Technology AAS</td>
</tr>
</tbody>
</table>

### INDUSTRIAL MAINTENANCE, MECHATRONIC, AAS

**PAGES 24-25**

<table>
<thead>
<tr>
<th>Job Prospects</th>
<th>Credential</th>
<th>Timeframe</th>
<th>Program</th>
</tr>
</thead>
</table>
| Paid Internship Entry Level Maintenance Tech | AMIST 1* Basic Skills Certificate | 6 months | AMIST 1
- Industrial Mechanical
- Industrial Electrical
- Industrial PLC |
| Industrial Maintenance Tech | AMIST 2* Intermediate Skills Certificate (plus experience) | 18 months | AMIST 1 plus
- Industrial Mechanical 2
- Industrial Electrical 2
- Industrial PLC2 |
| Industrial Maintenance Tech Level 2 | AMIST 3* Advanced Skills Certificate (plus experience) | 24 months | AMIST 1 & 2 plus
- Industrial Robots & Motion Control
- Advanced PLC
- Process Control and Industrial Instrumentation |
| Industrial Engineering Tech >> AAS Degree Transfer credits to 4 year BS Program | Mechatronics, AAS with AMIST 4 | >24 months | ALL AMIST Certificates plus
- Capstone Mechatronics Project
- Manufacturing Fundamentals
- General Education Requirements |
CERTIFICATE AND DEGREE PROGRAMS
INFORMATION TECHNOLOGY, A+, CISCO NETWORKING ACADEMY ®

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.

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

IT Essentials - Advanced
ZCOM-337 $1,650
Includes test fee.
Prerequisite of ZCOM 336
(use book from ZCOM 336)
Approximate time to complete: 200 hours

Available in Spanish

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

CCNA 7.0
Textbook additional fee.
CCNA 7.0 teaches comprehensive networking concepts and skills, from network applications to the protocols and services provided to these applications. Learners will progress from basic networking to more complex enterprise and theoretical networking models later in the curriculum. There are three courses that make up the CCNA 7.0 curriculum - they are aligned to cover the competencies outlined for the CCNA Certification Exam (200-301).

ENTERPRISE NETWORKING, SECURITY, AND AUTOMATION
ZCOM-416 $1095 for Approx. 90 hours (includes exam)
• Single-Area OSPFv2 Concepts and Configurations
• Network Security Concepts
• ACL Concepts
• ACLs for IPv4 Configuration
• NAT for IPv4
• WAN Concepts
• VPN and IPSec Concepts
• QoS Concepts
• Network Management
• Network Design, Troubleshooting, Virtualization and Automation

INTRO TO NETWORKS
ZCOM-413 $795 for Approx. 90 hours
Networking Today
• Basic Switch and Device Configuration
• Protocols and Models
• Physical Layer
• Number Systems
• Data Link Layer
• Ethernet Switching
• Network Layer

Topics Include:
• Address Resolution
• Basic Router Configuration
• IPv 4 & 6 Addressing
• ICMP
• Transport and Application Layer
• Network Security Fundamentals
• Build a Small Network

SWITCHING, ROUTING AND WIRELESS ESSENTIALS
ZCOM-414 $795 for Approx. 90 hours
• Basic Device Configuration
• Switching Concepts
• VLANs
• Inter-VLAN Routing
• STP
• EtherChannel
• DHCPv4
• SLAAC and DHCPv6 Concepts
• FHRP Concepts
• LAN Security Concepts
• Switch Security Configuration
• WLAN Concepts & Configuration
• Routing Concepts
• IP Static Routing
• Troubleshoot Static and Default Routes

Industrial Network Internet of Things (IIoT)

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.
**Schmidt Training and Technology Center**

**CERTIFICATE AND DEGREE PROGRAMS**

**MACHINE TOOL TECHNOLOGY**

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### Precision Machining Level 1

**BASIC CNC OPERATION**

(Z)MTT-100 $3,295

Skills needed for the operation of the CNC mill, CNC lathe and CNC grinder. Preparation for NIMS Level I certificate: CNC Mill Operation. Includes OSHA 10-hour General Industry Training Program. **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. **30 hours**

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### 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**

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### Precision Machining Level 2

**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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### Blueprint Reading

(Z)MTT-132 $1,695 (textbook additional)

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. **75 hours**

### CNC Programming

(Z)MTT-180 $1,695 (textbook additional)

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. **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.
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

TURNING TECHNOLOGY LEVEL II  
(Z)MTT-225 $1,695 (textbook additional)  
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.  
75 hours

CNC MILL LEVEL I  
(Z)MTT-185 $1,795 (textbook additional)  
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.  
75 hours

ENGINEERING GRAPHICS WITH SOLIDWORKS  
(Z)MTT-107 $1,195 (No Textbook Required)  
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.  
45 hours

Flexible start times available

These courses have an open start date. Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
Precision Machining Level 4

**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

**CAM PROGRAMMING**
(Z)MTT-288 $1,695 (textbook additional)
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. 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

**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

**Plus General Education Requirements**

*Gen Ed Courses AAS Degree ......................... 25 cr.
ORI 103 College Success Strategies .................. 3 cr.
MAT 165 Math Trigonometry .............................. 3 cr.
IFT 110 Microcomputer Applications .................. 3 cr.
SOC 130 Sociology ............................................ 3 cr.
COM 121 or 122 English Composition .................. 3 cr.
COM 141 Technical Writing ............................... 3 cr.
PHY 150 or 250 Applied Physics ......................... 4 cr.
Humanities Elective ........................................... 3 cr.

Flexible start times available

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

PICK AND CHOOSE - GET CERTIFIED IN JUST WHAT YOU NEED.

CNC Precision

- (Z)MTT 100 Basic CNC Operation
- (Z)MTT 101 Basic CNC Lathe
- (Z)MTT 180 CNC Programming
- (Z)MTT 185 CNC Milling Level 1
- (Z)MTT 276 Advanced CNC Turning
- (Z)MTT 272 CNC Milling Level 2
- (Z)MTT 288 CAM Programming

Design/CAD

- (Z)MTT 107 SOLIDWORKS
- (Z)MTT 132 Blueprint Reading
- (Z)MTT 288 CAM Programming
- (Z)MTT 310 Auto CAD
- ZMTT 330 Autodesk Fusion 360
- ZMTT 320 Autodesk Inventor
- ZMTT 341 Solidworks CAM
- ZMTT 350 Introduction to 3D Printing

Manual Machining Level 1

- (Z)MTT 105 Intro to Machining
- (Z)MTT 110 Basic Machine Tools
- (Z)MTT 157 Turning Technology Level 1
- (Z)MTT 158 Milling Technology Level 1

Manual Machining Level 2

- (Z)MTT 132 Blueprint Reading
- (Z)MTT 212 Milling Technology Level 2
- (Z)MTT 225 Turning Technology Level 2
- (Z)MTT 221 Grinding Technology

For description of all course reference pages 17-21
COMPUTER AIDED DESIGN (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.  
Prerequisite: Working knowledge of the Windows-based operating system.

**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.

**AUTODESK FUSION 360**  
**ZMTT 330**  
Average time for course completion: 45 hours  
Investment: $1,195  
Learn to use Autodesk Fusion 360 to create 3D part models, 2D part drawings and assemblies.

**AUTODESK INVENTOR**  
**ZMTT 320**  
Average time for course completion: 45 hours  
Investment: $1,195  
Learn to use Autodesk Inventor to create 3D part models, 2D part drawings and assemblies.

**SOLIDWORKS CAM**  
**ZMTT 341**  
Average time for course completion: 8 hours  
Investment: $275  
Learn how to use the included CAM function in Solidworks to create CNC milling toolpaths. You must be able to use Solidworks to complete this class.

**INTRODUCTION TO 3D PRINTING**  
**ZMTT 350**  
Average time for course completion: 8 hours  
Investment: $295  
Learn what 3D printing is and how a part gets printed.

Contact Judith Vecchio at 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

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

Electrical Lab

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.
Schmidt Training and Technology Center

UPGRADE YOUR SKILLS - FOUR MODERN TECHNOLOGY LABS

STUDENTS & EMPLOYERS

PLC Networking Lab

Allen Bradley, Siemens, Process Control, Communication, Troubleshooting

Smart Automation, Mechatronics and Robotics Lab

Programming, Process Control, Simulation, Communication, Troubleshooting

Schmidt Training and Technology Center Labs conveniently open Monday through Friday, accommodating both day and evening students.
RACC’s Mechatronics/AMIST 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>
<th>AMIST 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MET120</strong></td>
<td><strong>MET 120</strong></td>
<td><strong>MET 130</strong></td>
</tr>
<tr>
<td><strong>Industrial Mechanical –</strong></td>
<td><strong>Industrial Mechanical –</strong></td>
<td><strong>Industrial Electrical</strong></td>
</tr>
<tr>
<td><strong>Hydraulics Track</strong></td>
<td><strong>Pneumatics Track</strong></td>
<td><strong>ZTEC 371</strong></td>
</tr>
<tr>
<td><strong>ZTEC 356</strong></td>
<td><strong>ZTEC 371</strong></td>
<td><strong>ZTEC 227</strong></td>
</tr>
<tr>
<td>Approximately 162 hours of training, 5 college credits</td>
<td>Approximately 162 hours of training, 5 college credits</td>
<td>Approximately 120 hours of training, 4 college credits</td>
</tr>
<tr>
<td>Traditional or Hybrid Learning</td>
<td>Traditional or Hybrid Learning</td>
<td>Traditional or Hybrid Learning</td>
</tr>
<tr>
<td>• Hydraulics 1</td>
<td>• Pneumatics 1</td>
<td>• Electrical Control Circuits 1</td>
</tr>
<tr>
<td>• Hydraulics 2</td>
<td>• Pneumatics 2</td>
<td>• Electrical Control Circuits 2</td>
</tr>
<tr>
<td>• Pneumatics 1</td>
<td>• Pneumatics Maintenance</td>
<td>• Electrical Motor Control 1</td>
</tr>
<tr>
<td>• Pneumatics Maintenance</td>
<td>• Pneumatics Troubleshooting</td>
<td>• Electrical Motor Control 2</td>
</tr>
<tr>
<td>• Pneumatics Construction</td>
<td>• Hydraulics 1</td>
<td>• Electro-Fluid Power 1</td>
</tr>
<tr>
<td>• Piping Systems</td>
<td>• Piping Systems</td>
<td>• Electronic Sensors</td>
</tr>
<tr>
<td>• Hydraulic Troubleshooting</td>
<td>• Basic Mechanical Drives</td>
<td>• Residential/Commercial Wiring</td>
</tr>
<tr>
<td>• Basic Mechanical Drives</td>
<td>• Light &amp; Heavy Duty V-Belt and Chain Drives</td>
<td>• Industrial Electrical Wiring</td>
</tr>
<tr>
<td>• Light &amp; Heavy Duty V-Belt and Chain Drives</td>
<td>• Hydraulic Troubleshooting</td>
<td>• Industrial Power Distribution</td>
</tr>
</tbody>
</table>

| **MET 140-1**          | **MET 140-1**          | **MET 140-2**          |
| **Industrial PLC (SLC500)** | **Industrial PLC (SLC500)** | **Industrial PLC (SLC500)** |
| **ZTEC 428**          | **ZTEC 433**          | **ZTEC 433**          |
| Approximately 80 hours of training, 2 college credits | Approximately 40 hours of training, 2 college credits | Approximately 40 hours of training, 2 college credits |
| Investment: $2,025    | Investment: $2,025    | Investment: $1,025    |
| Traditional or Hybrid Learning | Traditional or Hybrid Learning | Traditional Learning only |
| • Introduction to PLC  | • Analog Application System | • Analog Application System |
| • Basic PLC Programming | • Data Highway 485 System | • Data Highway 485 System |
| • PLC Motor Control    | • Panelview Plus 6 DH-485 System w/ Keypad | • Panelview Plus 6 DH-485 System w/ Keypad |
| • Discrete I/O Interfacing | • Remote Input/Output | • 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.
### AMIST 3

**Industrial Robotics and Motion Control**

- **MET 200**
  - ZTEC 531
  - Approximately 140 hours of training, 4 college credits
  - Investment: $4,215
  - Robotics & Computer Programming
  - Flexible Manufacturing Systems
  - General Purpose Motion Control System
  - Multi-Axis Motion Control System

- **MET 210**
  - Process Control & Industrial Instrumentation
  - ZTEC 437
  - Approximately 90 hours of training, 3 college credits
  - Investment: $2,555
  - Pressure, Level, Flow, Heat & Cooling

**Advanced Industrial PLC - Your choice:**

- **MET 220**
  - Advanced Industrial PLC
  - ZTEC 438
  - Approximately 170 hours of training, 4 college credits
  - Investment: $3,995
  - PLC Controller and Troubleshooting Functions
  - Analog I/O Application System
  - Panelview Plus 1000 System
  - DeviceNet I/O Networking
  - ControlNet Networking
  - Ethernet/IP Networking

- **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

### AMIST 4

**Manufacturing Fundamentals**

- **MET 111**
  - ZTEC 561
  - Approximately 30 hours of training, 1 college credit - hybrid learning
  - Investment: $565
  - Principles of Advanced Manufacturing
    - Introduces typical plant processes such as
      - CNC, PLC and Automation
    - Reviews typical plant layouts for efficient manufacturing
    - Manufacturing personnel and their responsibilities
  - Lean Manufacturing
    - Introduces principles and methods of workplace organization using 5s methods
  - Communication Skills
    - Importance of effective communication, listening skills, and feedback
  - Safety Practices and Regulations
    - Reviews basic workplace safety concepts and practices
  - Personal Protection Equipment
    - Reviews the importance of Personal Protective Equipment (PPE)
    - Identifies 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

**Capstone Class:**

- **MET 240**
  - Mechatronics Application Project
  - ZTEC 558
  - Approximately 120 hours of training, 3 college credits
  - Investment: $3,200
  - This course provides students the opportunity to apply skills and knowledge gained from training in the electrical, mechanical and process control program areas to an independent mechatronics project. The student, working with another student or an instructor, will develop and implement a project plan that will demonstrate the student's ability to integrate the skills and knowledge learned.

**Introduction To Shop Machinery**

- **MET 101**
  - 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

**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.
- 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.
ENGINEERING/ PRODUCTION/ MAINTENANCE

ZTEC 907 - Average time for course completion: 32 hours - Investment $985

INTRO TO SMART SENSORS, DATA ACQUISITIONING & HMI
Average time for course completion: 8 hours
- Automation Operations
- Cloud-based Data Acquisition (SQUEAKS AP)
- SMART Sensors
- Into to HMI Panel Operation
- SMART Sensor Skill Application Project

INTO TO ROBOTICS - Motoman Robot FS100 Basic Programming with Material Handling
- OR-
Fanuc Robot with Handling Tool Software
Average time for course completion: 8 hours
- Start-Up and Shutdown
- Tech Pendant Overview
- Jogging and Coordinates
- Alarm and Errors
- Selecting a Job
- Hands-On Skills

TYPES OF AUTOMATION AND HOW TO JUSTIFY AUTOMATING
Average time for course completion: 8 hours
- Parts Feeders, Vision, Robots, Semi Automated, Fully Automated, VR, AR, Conveyors
- Determining Real Cost and Projected Returns
- In-House vs. Out-Source
- Steps to Get Started
- Project

LEADING IN A CHANGING ENVIRONMENT
Average time for course completion: 8 hours
- Communicating Virtually
- Time Management in Real-Time World
- Metrics, Measuring, and Monitoring
- Collaboration with Accountability
- Employee Engagement and Retention Strategies
Your company's customized training plan:

Who - each employee / student can receive their own customized plan.

When, Where – The STTC has very convenient hours of operation catering to all shifts.

What – you design the training programs to meet your needs.

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

This example employee training plan combines courses from different disciplines.

SAVE TIME AND RESOURCES! Pre-assess your employee's technical theory and skills prior to program / course selections.

Pre-Assessment Service

Technical Theory and Skills

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.
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/ZTEC 560
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

Contact Judith Vecchio at 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
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

**Key Competencies Taught and Assessed:**

**Safety**
- 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**
- 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**
- 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**
- 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
Schmidt Training and Technology Center

CPT & CPT PLUS (PATHWAYS TO SUCCESSFUL CAREERS)
COMPREHENSIVE LEARNING AND ASSESMENT 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>Course</th>
<th>E-learning only</th>
<th>Investment - $165 per E-learning Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>ZTEC 807 - English</td>
<td>ZTEC 811 - Spanish</td>
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<tr>
<td>Quality Practices &amp; Measurement</td>
<td>ZTEC 808 - English</td>
<td>ZTEC 812 - Spanish</td>
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<tr>
<td>Manufacturing Processes &amp; Production</td>
<td>ZTEC 809 - English</td>
<td>ZTEC 813 - Spanish</td>
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<td>Maintenance Awareness</td>
<td>ZTEC 810 - English</td>
<td>ZTEC 814 - Spanish</td>
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MSSC Skill Building

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

<table>
<thead>
<tr>
<th>Average Time for Course Completion: 37 hours</th>
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<td>Investment - $285 (includes E-learning and 1 Assessment)</td>
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<tr>
<td>ZTEC 819 - English</td>
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<tr>
<td>ZTEC 820 - English</td>
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<tr>
<td>ZTEC 821 - English</td>
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<tr>
<td>ZTEC 822 - English</td>
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CPT Plus

<table>
<thead>
<tr>
<th>Skill Boss with Assessment</th>
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<tbody>
<tr>
<td>= 1 + 2 + $205 Assessment for CPT Plus</td>
</tr>
</tbody>
</table>

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.

racc.edu
INDIVIDUAL COURSES
UPGRADE YOUR SKILLS - MECHANICAL LAB

Schmidt Training and Technology Center
racc.edu

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

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

Central Lubrication

CENTRAL LUBRICATION – ZTEC 318
Average time for course completion: 20 hours  Investment: $495
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

Lubrication

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
MECHANICAL DRIVES 1 – ZTEC 311 IS THE PREREQUISITE FOR DRIVES AND PUMPS TRAINING

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

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

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

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
NEW TO ELECTRICAL? START HERE.
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 (Allen Bradley or Siemens)
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 Conductors, 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

AC/DC ELECTRICAL SYSTEMS ZTEC 205 AND ELECTRIC MOTOR CONTROL ZTEC 207 ARE PREREQUISITE COURSES FOR PLC TRAINING.

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 6 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 DEVICENET 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

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Schmidt Training and Technology Center

INDIVIDUAL COURSES
UPGRADE YOUR SKILLS - PLC LAB

STUDENTS & EMPLOYERS

AC/DC ELECTRICAL SYSTEMS ZTEC 205 AND ELECTRIC MOTOR CONTROL ZTEC 207 ARE PREREQUISITE COURSES FOR PLC TRAINING.

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

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

Contact Judith Vecchio at 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

**PREREQUISITE ZTEC 543 - ROBOTICS AND COMPUTER PROGRAMMING**

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

**MOTION CONTROL (SERVO) LEARNING SYSTEM – ZTEC 520**

Average time for course completion: 36 hours
Investment: $1,155

Teaches the fundamentals of current industrial servo drive systems. Servo drives are the core components to precise positioning in packaging, labeling, conveying and CNC machining environments.

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

**PREREQUISITE ZTEC 520 - MOTION CONTROL (SERVO) LEARNING SYSTEM**

Teaches multi-axis servo drive configurations as essential for synchronizing multiple operations in packaging, labeling, conveying, CNC machining environments and warehouse management systems.

LAP 1 Multi-Axis Motion Control Systems  
LAP 2 Motion Control Camming  
LAP 3 Synchronized Motion

**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

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

Without Leaving Your Office

Six 1-hour Rapid-Attack Webinars

WHO SHOULD ATTEND?

C-Suite, Owner/Operators, and other Executive Leaders who

● want to protect their business and
● make the smartest, tactical moves NOW.

WHAT’S THE VALUE?

Six 1-hour webinars tailored to the unprecedented challenges business leaders face right now and will continue to encounter in the near future.

1 | Reduce Cost – NOW
2 | Improve Mfg Profitability – NOW
3 | Grow eCommerce Revenue – NOW
4 | Activate Your Tools for Profit – NOW
5 | Drive Lead Generation – NOW
6 | Get Your Team in SHAPE – NOW

● Save Cash
● Protect your Profits
● Breathe so you can plan your next move

Vital Leader Roundtable

(Meet monthly with other Leaders)

✓ Bounce ideas
✓ Brainstorm strategies
✓ Apply new competencies

Drive short-term performance for your business

To Learn More Contact Bonnie Spayd
bspayd@racc.edu | 610-607-6207 office | 484-256-8800 cell
Skill Building for Supervisors / Team Leads
This 6-hour workshop presents supervisors and team leads with proven Best Practices to successfully coach and lead highly productive teams.

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

Train-the-Trainer (for effective cross-training)
This 6-hour workshop presents supervisors, team leads, and in-house trainers with proven on-the-job training skills. Participants will learn the process for effective OJT; the role of thoughtful communication, motivation and goal setting; the basics of adult learning; and the common roadblocks to effective training and learning.

Effective Communication Skills
- Communication Styles
- Learning Preferences
- Principles of Adult Learning
- Stages of Learning
- Motivation
- Generational Differences
- Goal Setting

The Highly Productive Leader
Designed for Supervisors / Team Leads
3 Skill Building Workshops with Clear, Relatable Tools

Session 1 | Awareness | 3 hours
Effective Communication, Team Building
- Defining a good leader, Your role in the workplace
- How do I rate now?, How do I improve?, #1 skill needed to succeed

Session 2 | Empowerment | 3 hours
Leading as a Coach, Performance Management Techniques
- The 5 languages of motivation
- Positive Reinforcement Techniques

Session 3 | Confidence | 3 hours
Communicating with Difficult People, Managing Conflict
Handling Stress in the Workplace, Time Management and Goal Setting
- Authentic Leadership – be true to yourself in difficult situations
- Documentation Best Practices

Command Spanish - Pronunciation and Culture
This 6-hour workshop utilizes phonetic encoding to address pronunciation of key Spanish commands, questions, and phrases pertinent to daily interactions between supervisors and employees.

- Print/Sound Relationships; Rules for Spanish Accentuation
- Phonetic Encoding; Pronunciation Practice for Phonetic Encoding
- Hispanic Culture, Etiquette and Social Niceties; Greeting and Goodbyes, Complimenting Employees
- Employment Issues, Job Orientation; Hiring and Dismissal, Job Orientation, Attendance
- Medical Emergencies, Safety Issues; Clothing, Protection, Safety rules, Reports
- Work Rules, Supervision and Safety; Smoking regulations, Breaks, Parking, Phone usage
- Control and Command for Site Supervision; Maintenance Phrases, Loading and Unloading, Quality Control

Also available: Banking, Real Estate, Nursing, Dental Offices, etc.

COVID-19 Recovery & “Safe Learning” Workshops
Call to explore your on-site and Zoom LIVE delivery options.

Visit https://sttc.racc.edu to learn more

Our Workforce Development Team delivers custom training solutions that meet your needs.
Contact Allison Creveling 610.607.6208, acreveling@racc.edu for details.
Internal Quality Auditor Training
ISO9001:2015 Compliance; 4-hour Workshop

Focus Areas:
Overview of ISO 9001:2015
- Definition of a ISO 9001 Quality System
- Requirements for Internal Audits
- Other Core Requirements

Planning Internal Audits
- Issuing the Yearly Audit Schedule
- Use of an Audit Applicability Matrix
- Creating an Audit Plan

Performing an Audit
- Assignments of the Auditors
- Executing the Audit Plan
- Best Practices for Conducting Audit Interviews

Documenting and Closing an Audit*
- Major & Minor Compliances and Opportunities for Improvement
- Writing and Issuing Non-compliances
- Tracking and Closing Non-compliances

Delivering Superior Customer Service
This 6-hour workshop provides best practice skills and tools to enable your business teams to deliver superior service by managing customer expectations and building customer relationships.

Focus Areas:
- Managing dual roles:
  - Representing the customer to your company
  - Representing your company to the customer
- Determining Customer Wants vs. Needs
- Balancing a Customer vs. Product Focus
- Interacting with Different Customer Personality Types
- Knowing Your Customer's Business
- Communicating Effectively:
  - Communication Types
  - Communication Model
  - Listening Skills and Blocks
- Handling Non-Standard and Out of Scope Requests
- Dealing with Difficult Customer Situations
- Managing Time and Tasks in a Customer Service Environment
- Analyzing a Customer SWOT

Essential Consultative Selling Skills
This 6-hour workshop provides sales teams with best practices, skills, tools and a framework to develop mutually beneficial solutions that effectively engage customers throughout the complex sales process.

Focus Areas:
- Pre-call preparation & the “POP” model
- Minimizing the unknown via “Discovery”
- Communicating effectively in the complex sale:
  - Active listening and common blocks
  - Great questions vs. good questions
  - Adapting to Customer styles
  - Evaluating & engaging key decision-makers via the “3 As”
- Demonstrating value over cost
- Managing the 3 dimensions of negotiations
- Employing the 7 Sales negotiation principles
- Satisfying customer needs over wants
- Maintaining a customer vs. product focus
- Establishing Customer relationships – Vendor or Partner?
- Balancing dual roles:
  - Representing your company to the customer
  - Representing the customer to your company

Leading in a VUCA Business Environment
Volatility, Uncertainty, Complexity, and Ambiguity
Leaders require more than traditional skills to engage highly productive teams and drive results in today’s “VUCA” business environment. Success is dependent upon not only leaders’ skill sets, but just as importantly, their mindsets.

This 6-hour workshop provides leaders with practices, skills and tools to enable them to effectively lead both themselves and their teams.

Focus Areas:
- Leading Relationally
- Demonstrating Resilience
- Developing Self-Awareness
- Communicating Intentionally
- Practicing Emotional Intelligence
- Prioritizing Time & Tasks
- Delegating Purposefully
- Building & Engaging Teams

Our Workforce Development Team delivers custom training solutions that meet your needs. Contact Allison Creveling 610.607.6208, acreveling@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.

SPECIALTY TRAINING
ON-LINE PROGRAMS • ADVANCED CAREER TRAINING

Features: 6-18 month self-paced, start anytime, textbook and materials included, Prepare for industry certification, Certification exam vouchers are included, Financial assistance available, Student advisors provide you coaching, motivation, and career readiness support.

Certified Administrative Professional with Microsoft Office Master 2016 (Vouchers Included)
This program provides the information you need to know to sit for the Certified Administrative Professional (CAP) exam offered by the International Association of Administrative Professionals (IAAP) and the Microsoft Office Master 2016 Certification exams. 335 HRS

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
**Schmidt Training and Technology Center**

**Supplier Chain/Warehousing Plant Technician**

**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**
PREREQUISITE ZTEC 311 - MECHANICAL DRIVES 1
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**
PREREQUISITE ZTEC 311 - MECHANICAL DRIVES 1
Average time for course completion: 4 hours
Investment: $139

**Vibration Analysis – ZTEC 316**
PREREQUISITE ZTEC 311 - MECHANICAL DRIVES 1
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.
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

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

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

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

These courses have an open start date.
Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
Program Description - This 180-hour certification program prepares you for licensing as a wastewater treatment plant operator. The 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 – We combine course work with onsite visits to local WWT facilities, plus interactive class discussion with certified operators, out of class assignments, and module end exams.

PROGRAM COMPONENTS

ZWTR 120 – 90 HRS – FALL 2021 - $1,375

Component 1: Intro to Wastewater Treatment – 18 hours
- Fundamentals of Wastewater Treatment
- General Math, General Chemistry

Component 2: Collection System – 18 hours
- Wastewater Collection System I & II
- Land Application of Wastewater
- Infiltration & Inflow/Wet Weather
- Solids Handling & Disposal
- Pumps & Hydraulics, Intro & Advanced Flow Meter
- Sequential Batch Recorders, Biosolids, Chemical Feed Systems

Component 4: Miscellaneous Topics – 18 hours
- Energy Efficiency
- SOP Preparation/NPDES Permit
- Discharge Monitoring Reports
- Administration of Treatment Plants
- Industrial Pretreatment

Component 5: Laboratory and Maintenance – 18 hours
- Wastewater Laboratory Basics
- Treatment Plant Maintenance

ZWTR 121 – 90 Hrs - Spring 2022 - $1,375

Component 6: Treatment Types – 18 hours
- Ponds & Lagoons
- Trickling Filter Process
- Rotating Biological Contactors

Component 7: Land Applications & Solids – 18 hours
- Land Application of Wastewater
- Solids Handling and Disposal
- Sequential Batch Recorders
- Biosolids

Component 8 & 9: Activated Sludge – 36 hours
- Activated Sludge Math
- Activated Sludge 1-4

Component 10: Advanced Topics – 18 hours
- Communication Techniques
- Disinfection and Chlorination
- Effluent Filtration
- Advanced Wastewater Treatment

Learn More - Contact Allison Creveling at acreveling@racc.edu or call 610.607.6208.

To Register By Phone (610.607.6235) | Register On-line www.racc.edu/academics/course-registration-course-catalogs

Cost for the full 180-hour certification program for program year 2021-22 is $2,750. The second half of the program includes a scholarship opportunity. Cost for each 18-hour component is $285.
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.

The Literacy Programs Information Center is located in Schuylkill Hall 2nd floor and serves as an informational hub for those inquiring about RACC’s ABE/HEP/ESL non-credit Literacy Programs. Whether you have questions about specific classes, registration and/or testing dates, contact the Literacy Programs Information Center staff.

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.

Please call 610.372.4721, Ext. 5322 for additional information about literacy programs.

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
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!)”

“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.

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

Please call 610.372.4721, Ext. 5322 for additional information about literacy programs.
Please call an Enrollment Coordinator at 610.607.6224 for additional information on these programs.
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 racce.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.

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
Date ____________________________ RACC ID # ____________________________
Name/Company Name ____________________________ SS #/Birthdate ____________________________
Home/Company Address ___________________________________ City __________________ State _____ Zip __________
Home Phone ____________________________ Work Phone ____________________________ Email address ____________________________
Signature of Registrant ____________________________________________________________________________________________
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
□ Asian
Race: □ American Indian/Alaskan Native 
□ Black/African-American
□ White
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.
DENTAL ASSISTING PROGRAM

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.*

- Opportunities for career advancement
- Good hourly wages
- Good working environment
- Flexible hours
- Working as a member of a health care delivery team
- Ability to help others

Dental Assistant positions are in high demand and will continue to grow 11%

To learn more, call 610.375.8188 or visit racc.edu/dental

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PHARMACY TECHNICIAN PROGRAM

RACC, in partnership with Tower Health, is proud to offer the 15-week Pharmacy Technician program. This program is designed to prepare the students to take the national certification examination administered by the Pharmacy Technician Certification Board (PTCB). Students who complete the pharmacy technician program can seek employment in hospital settings and/or retail pharmacies.

The Pharmacy Technician Program will be held from 5:00 p.m. to 9:00 p.m. three days per week starting on January 18, 2021.

The program is $2,495.00.

Students will experience classroom content, lectures, hands-on lab training, and practicum experience in a hospital setting.

Pharmacy Technician positions are in high demand and will continue to grow 10%

To learn more, call 610.375.8188 or visit racc.edu/PharmTech