WORKFORCE DEVELOPMENT

The Workforce Development Team at Reading Area Community College is dedicated to providing a continuum of learning in

- Advanced manufacturing skills
- CNC Machining and Manual Machining
- Information technology (IT)
- Market knowledge
- Business Critical Skills
- Business performance and workforce readiness that meets the demands of the local and regional labor market

Manufacturing, IT and business professionals provide training using a hands-on learning approach. The staff of Workforce Development understands employers’ technology challenges, operating systems and business performance objectives. We understand that business and industry growth is increasingly centered on new IT applications in addition to advanced technical innovation. We know that successful employers must find new ways to produce and deliver products and services to customers who will purchase these goods at prices that will provide profit. The offerings of the Schmidt Training and Technology Center provide customized senior leadership and employee training that adjusts to the unique and changing needs of business and industry employers.
INTRODUCING OUR NEWEST EQUIPMENT

**Mitutoyo CRISTA-Apex V544 CNC Coordinate Measuring Machine**

The CRISTA-Apex V series is a new generation CNC CMM that delivers great versatility and speed while leveraging IoT technologies for smart factory opportunities. The CRISTA-Apex V provides accuracy that is unmatched by any previous general purpose measuring machine for small to mid-sized workpieces.

- SMS (Smart Measuring System) – system for on-line monitoring and operational status of a measuring machine with data visualization to enable product quality improvement
- Real-time CMM and workpiece temperature compensation (standard feature)
- High-speed optimal path scanning with high-speed active scanning
- Multi-sensor support with an array of contact and non-contact probes that includes tactile, scanning, laser, optical, surface finish measuring

**Universal Robots UR3e**

The UR3e is the ideal definition of a collaborative, industrial robot. Designed to optimize efficiency in confined workspaces, the UR3e offers unmatched flexibility and precision. While the cobot can be mounted on a table working side-by-side with employees, it can also be integrated within a separate workstation for solutions including picking, assembling, and placing parts.

**Portable Siemens Learning System**

990-PS712 Portable PLC Learning System provides a complete curriculum and application workstation that teaches modern PLC systems as used in today’s industry. Students learn a broad range of applications using the robust Siemens S7-1200 PLC and use HMI panels and networks throughout the curriculum. Students learn industry-relevant skills including how to operate and program PLC systems for a wide range of real-world applications. Within the 990-PS712F, Amatrol offers FaultPro 4.0, the industry’s premier program utilizing electronic faults, and covers topics including how to troubleshoot PLC power supply problems, how to test analog and discrete input devices, and how to solve software problems.
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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 employability, future employment, licensure, certification or availability of courses, program, instructors or curriculum.

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

A+ SERIES: IT ESSENTIALS

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

IT ESSENTIALS - FUNDAMENTALS
ZCOM-336 $1,815
Textbook additional fee.
Includes test fee.
Approximate time to complete: 200 hours
Instructor support during lab hours.

IT ESSENTIALS - ADVANCED
ZCOM-337 $1,815
Includes test fee.
Prerequisite of ZCOM 336 (use book from ZCOM 336)
Approximate time to complete: 200 hours
Instructor support during lab hours.

SECURITY+
ZCOM-355 $3,075
Includes test fee.
Approximate time to complete: 200 hours
Instructor support during lab hours.

available in Spanish

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

CompTIA

CCNA 7.0
Textbook additional fee.
Instructor support during lab hours.

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 course 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 $1205 for Approx. 90 hours
Instructor support during lab hours.
(includes exam)

INTRO TO NETWORKS
ZCOM-413 $875 for Approx. 90 hours

SWITCHING, ROUTING AND WIRELESS ESSENTIALS
ZCOM-414 $875 for Approx. 90 hours
Instructor support during lab hours.

IIOT
ZCOM-419 $1,405 for Approx. 90 hours
Instructor support during lab hours.
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.
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.

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**AMIST 1 (ADVANCED MANUFACTURING INTEGRATED SYSTEMS)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
<th>Hours</th>
<th>Investment</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 120</td>
<td>Industrial Mechanical - Hydraulics Track</td>
<td>5 college credits</td>
<td>Approximately 162 hours of training</td>
<td>$4,935</td>
<td>Traditional or Hybrid Learning: Hydraulics 1, Hydraulics 2, Pneumatics 1, Pneumatics Maintenance, Pneumatics Construction, Piping Systems, Hydraulic Troubleshooting, Basic Mechanical Drives, Light &amp; Heavy Duty V-Belt and Chain Drives.</td>
</tr>
<tr>
<td>ZTEC 356</td>
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<tr>
<td>MET 120</td>
<td>Industrial Mechanical - Pneumatics Track</td>
<td>5 college credits</td>
<td>Approximately 162 hours of training</td>
<td>$4,935</td>
<td>Traditional or Hybrid Learning: Pneumatics 1, Pneumatics 2, Pneumatics Maintenance, Pneumatics Troubleshooting, Hydraulics 1, Piping Systems, Basic Mechanical Drives, Light &amp; Heavy Duty V-Belt and Chain Drives.</td>
</tr>
<tr>
<td>ZTEC 371</td>
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<tr>
<td>MET 130</td>
<td>Industrial Electrical</td>
<td>4 college credits</td>
<td>Approximately 120 hours of training</td>
<td>$3,535</td>
<td>Traditional or Hybrid Learning: Electrical Motor Control, Electo-Fluid Power 1, Electronic Sensors, Residential/Commercial Wiring, Industrial Electrical Wiring, Industrial Power Distribution.</td>
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<tr>
<td>ZTEC 227</td>
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**AMIST 2 (ADVANCED MANUFACTURING INTEGRATED SYSTEMS)**

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
<th>Hours</th>
<th>Investment</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>MET 150</td>
<td>Industrial Mechanical 2 - Hydraulics Track</td>
<td>6 college credits</td>
<td>Approximately 170 hours of training</td>
<td>$4,860</td>
<td>Traditional or Hybrid Learning: Spur Gear &amp; Multiple Shaft Drives, Belts, Lubrication, Shaft Alignment and Couplings, Mechanical Drives 3 &amp; 4, Floor Standing Conveyors, Vibration Analysis, Laser Alignment, Hydraulic Maintenance, Pneumatic Directional Control Valves &amp; Air Logic, Advanced Pneumatics, Pneumatic Troubleshooting.</td>
</tr>
<tr>
<td>ZTEC 369</td>
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</tr>
<tr>
<td>MET 150</td>
<td>Industrial Mechanical 2 - Pneumatics Track</td>
<td>6 college credits</td>
<td>Approximately 170 hours of training</td>
<td>$4,860</td>
<td>Traditional or Hybrid Learning: Spur Gear &amp; Multiple Shaft Drives, Synchronous Belt Drives, Lubrication Concepts, Precision Shaft Alignment, Couplings, Mechanical Drives 3 &amp; 4, Floor Standing Conveyors, Vibration Analysis, Laser Alignment, Hydraulic Maintenance, Hydraulics 2, Hydraulic Troubleshooting.</td>
</tr>
<tr>
<td>ZTEC 375</td>
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<tr>
<td>MET 160</td>
<td>Industrial Electrical 2</td>
<td>3 college credits</td>
<td>Approximately 115 hours of training</td>
<td>$2,480</td>
<td>Traditional or Hybrid Learning: Basic Electrical Machines System, Advanced Electric Motor Controls, DC Electronic Drives, AC Electronic Drives, PLC/VFD Wiring.</td>
</tr>
<tr>
<td>ZTEC 242</td>
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</tbody>
</table>

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**AMIST 1 (ADVANCED MANUFACTURING INTEGRATED SYSTEMS)**

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</tr>
</thead>
<tbody>
<tr>
<td>MET 140-A</td>
<td>Industrial PLC (SLC500)</td>
<td>2 college credits</td>
<td>Approximately 80 hours of training</td>
<td>$2,230</td>
<td>Traditional or Hybrid Learning: PLC Motor Control, Discrete I/O Interfacing, Intro to PLC Troubleshooting, PLC Systems Troubleshooting, Event Sequencing, Application Development, Timer &amp; Counter Instructions, PLC Control Instructions, Math and Data Move Instructions.</td>
</tr>
<tr>
<td>ZTEC 428</td>
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<tr>
<td>MET 140-B</td>
<td>Industrial PLC (SLC500) 2</td>
<td>2 college credits</td>
<td>Approximately 40 hours of training</td>
<td>$1,130</td>
<td>Traditional or Hybrid Learning: Analog Application System, Data Highway 485 System, Panelview Plus 6 DH-485 System w/ Keypad, Remote Input/Output.</td>
</tr>
<tr>
<td>ZTEC 433</td>
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**AMIST 2 (ADVANCED MANUFACTURING INTEGRATED SYSTEMS)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
<th>Hours</th>
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<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MET 160</td>
<td>Industrial Electrical 2</td>
<td>3 college credits</td>
<td>Approximately 115 hours of training</td>
<td>$2,480</td>
<td>Traditional or Hybrid Learning: Basic Electrical Machines System, Advanced Electric Motor Controls, DC Electronic Drives, AC Electronic Drives, PLC/VFD Wiring.</td>
</tr>
<tr>
<td>ZTEC 242</td>
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</tbody>
</table>

These courses have an open start date. Contact 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
AMIST 3 (ADVANCED MANUFACTURING INTEGRATED SYSTEMS)

MET 200
Industrial Robotics and Motion Control
ZTEC 531
Approximately 140 hours of training, 4 college credits
Investment: $4,635
- Robotics & Computer Programming
- Flexible Manufacturing Systems
- General Purpose Motion Control System
- Multi-Axis Motion Control System

MET 220
Advanced Industrial PLC
ZTEC 438
Approximately 170 hours of training, 4 college credits
Investment: $4,395
- PLC Controller and Troubleshooting Functions
- Analog I/O Application System
- Panelview Plus 7
- DeviceNet I/O Networking
- ControlNet Networking
- Ethernet/IP Networking

MET 220
Advanced Industrial PLC - Your choice:

OR

MET 220
Advanced Industrial PLC Siemens S7-300
ZTEC 439
Approximately 140 hours of training, 4 college credits
Investment: $4,395
- Controller & Troubleshooting Functions
- Analog I/O Application System
- Profibus Communications System
- TP1200 Operator Panel (HMI)
- Remote Input/Output
- Math and Data Move Instructions

AMIST 4 (ADVANCED MANUFACTURING INTEGRATED SYSTEMS)

MET 111
Manufacturing Fundamentals
ZTEC 561
Approximately 30 hours of training, 1 college credit - hybrid learning
Investment: $625
- 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

MET 240
Capstone Class:
Mechatronics Applications Project
ZTEC 437
Approximately 120 hours of training, 3 college credits
Investment: $3,520
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.

MET 101
Introduction To Shop Machinery
ZTEC 558
Average time for course completion: 90 hours
3 college credits.
Investment: $2,625
- 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

*Gen Ed Courses AAS Degree
31 cr.

- CSS 103 College Success Strategies 3 cr.
- MAT 160 College Algebra 3 cr.
- COM 121 or 122 English Composition 3 cr.
- PHY 245 Physics II 4 cr.
- IFT 110 Microcomputer Applications 3 cr.
- SOC 130 Sociology 3 cr.

Select one

- BIO 150, Biology I 4 cr.
- CHEM 150, Chemistry I 3 cr.
- PHY 245, Physics II 3 cr.
- COM 141 Technical Writing 3 cr.
- HUM 100 Critical Thinking 3 cr.
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

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

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

For description of all courses, reference pages 10-13
Precision Machining Level 1

**ENTRY LEVEL CNC MACHINE OPERATOR**

**BASIC CNC OPERATION**
(Z)MTT-100  $3,625
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  $645
Teaches basic set up and operation of CNC lathes. Preparation NIMS Level I certificate: CNC Lathe Operation. Co-requisite: (Z)MTT-100 30 hours

**INTRODUCTION TO MACHINING**
(Z)MTT-105  $1,920 (textbook additional)
Theoretical and practical aspects of shop safety, hand tools, precision layout, precision measuring instruments, taps, dies, files, reamers, and identification and use of appropriate materials to manufacture parts are covered. Preparation for two NIMS Level I certifications: Measurement, Materials and Safety; Layout and Bench work. 75 hours

**BASIC MACHINE TOOLS**
(Z)MTT-110  $1,920 (textbook additional)
Basic operations of the drill press, pedestal grinder and band saw will be covered. Preparation for the NIMS Level I certification: Drill Press. 75 hours

**Flexible start times available**

**Precision Machining Level 2**

**TURNING TECHNOLOGY LEVEL I**
(Z)MTT-157  $1,920 (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  $1,920 (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: 75 hours

**BLUEPRINT READING**
(Z)MTT-132  $1,865 (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  $1,865 (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

Flexible start times available

These courses have an open start date.
Contact Judith Vecchio at 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
MILLING TECHNOLOGY LEVEL II (Z)MTT-212
Time: 75 hours
Cost: $1,920 (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.

TURNING TECHNOLOGY LEVEL II (Z)MTT-225
Time: 75 hours
Cost: $1,920 (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.

CNC MILL LEVEL I (Z)MTT-185
Time: 75 hours
Cost: $2,030 (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.

ENGINEERING GRAPHICS WITH SOLIDWORKS
Time: 45 hours
(Z)MTT-107 $1,315 (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.

Flexible start times available

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

**CNC MILLING II**
(Z)MTT-272
$2,030 (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
$1,865 (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
$1,920 (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
$2,030 (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
$1,370 (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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>CSS 103</td>
<td>College Success Strategies</td>
<td>3 cr.</td>
</tr>
<tr>
<td>MAT 165</td>
<td>Math Trigonometry</td>
<td>3 cr.</td>
</tr>
<tr>
<td>IFT 110</td>
<td>Microcomputer Applications</td>
<td>3 cr.</td>
</tr>
<tr>
<td>SOC 130</td>
<td>Sociology</td>
<td>3 cr.</td>
</tr>
<tr>
<td>COM 121 or 122</td>
<td>English Composition</td>
<td>3 cr.</td>
</tr>
<tr>
<td>COM 141</td>
<td>Technical Writing</td>
<td>3 cr.</td>
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<tr>
<td>PHY 240</td>
<td>Physics I</td>
<td>4 cr.</td>
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<tr>
<td>Humanities Elective</td>
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<td>3 cr.</td>
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</table>

*Gen Ed Courses AAS Degree .................... 25 cr.

Flexible start times available

These courses have an open start date. Contact Judith Vecchio at 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
COMPUTER AIDED DESIGN (CAD)

AUTOCAD - ZMTT 310
Average time for course completion: 36 hours
Investment: $910
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: $1,315
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: $1,315
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: $1,315
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: $305
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: $325
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.
### Hand Tools, Safety, Quality

**MECHANICAL FABRICATION**  
**BASIC SKILLS - ZTEC 390**  
Average time for course completion: 32 hours  
Investment: $675  
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: $305  
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: $1,140  
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: $1,320  
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: $2,625  
- 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: $899  
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

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**Manufacturing/Technical Basics**

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

**BASIC HYDRAULICS – ZTEC 300**  
Average time for course completion: 20 hours  
Investment: $585  
- 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: $670  
- LAP 1: Hydraulic DCV Applications  
- LAP 2: Hydraulic Cylinder Applications  
- LAP 3: Hydraulic Relief Valve Operation  
- LAP 4: Hydraulic Check Valve Applications  
- LAP 5: Accumulator Applications

**ADVANCED HYDRAULICS – ZTEC 302**  
Average time for course completion: 15 hours  
Investment: $399  
- LAP 1: Hydraulic Motor Applications  
- LAP 2: Hydraulic Pump and Motor Performance  
- LAP 3: Fluids and Conditioning

**HYDRAULIC TROUBLESHOOTING – ZTEC 308**  
Average time for course completion: 45 hours  
Investment: $1,230  
- 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 Counterbalance Valves  
- LAP 9: Troubleshooting Hydraulic Systems

**HYDRAULIC MAINTENANCE – ZTEC 3017**  
Average time for course completion: 20 hours  
Investment: $670  
- LAP 1: Hydraulic Filter Maintenance  
- LAP 2: Hydraulic Fluid Maintenance  
- LAP 3: Fittings and Seals  
- LAP 4: Hose and Clamping Devices  
- LAP 5: Tubing and Component Installation

## Pneumatics

**BASIC PNEUMATICS – ZTEC 305**  
Average time for course completion: 16 hours  
Investment: $450  
- 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: $395  
- 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: $395  
- 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: $960  
- 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: $175

## Rigging

**RIGGING SYSTEMS 1 – ZTEC 357**  
Average time for course completion: 35 hours  
Investment: $890  
- 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: $395  
- LAP 1: Wire Mesh Slings  
- LAP 2: Synthetic Slings  
- LAP 3: Equipment Movement

## Lubrication

**CENTRAL LUBRICATION – ZTEC 318**  
Average time for course completion: 20 hours  
Investment: $545  
- 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
MECHANICAL DRIVES 1 – ZTEC 311
Average time for course completion: 35 hours
Investment: $985
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: $985
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: $985
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: $565
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: $175

VIBRATION ANALYSIS – ZTEC 316
Average time for course completion: 12 hours
Investment: $385
LAP 1  Intro to vibration analysis
LAP 2  Vibration condition monitoring
LAP 3  Vibration analysis

MECHANICAL DRIVES 4 – ZTEC 314
Average time for course completion: 20 hours
Investment: $565
LAP 1  Brakes and Clutches
LAP 2  Brake/Clutch Selection and Maintenance
LAP 3  Linear Ball Bushings
LAP 4  Ball Screw Drives

LASER ALIGNMENT – ZTEC 317
Average time for course completion: 8 hours
Investment: $265
LAP 1  Intro to laser shaft alignment
LAP 2  Laser shaft alignment operation

CENTRIFUGAL PUMP SYSTEMS – ZTEC 319
Average time for course completion: 20 hours
Investment: $580
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: $175

PERISTALTIC PUMP – ZTEC 321
Average time for course completion: 4 hours
Investment: $175

MAGNETIC PUMP – ZTEC 322
Average time for course completion: 4 hours
Investment: $175

CENTRIFUGAL PUMP /STUFFING BOX – ZTEC 323
Average time for course completion: 4 hours
Investment: $175

MULTIPLE PUMP LEARNING SYSTEM – ZTEC 352
Average time for course completion: 4 hours
Investment: $175

GEAR PUMP – ZTEC 353
Average time for course completion: 4 hours
Investment: $175

PISTON PUMP – ZTEC 354
Average time for course completion: 4 hours
Investment: $175

TURBINE PUMP – ZTEC 372
Average time for course completion: 4 hours
Investment: $175

PIPING SYSTEMS – ZTEC 310
Average time for course completion: 35 hours
Investment: $1,020
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: $825
- 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

### ELECTRIC MOTOR CONTROL – ZTEC 207
#### Average time for course completion: 50 hours
- Investment: $1,370
- 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 RELAY CONTROL SYSTEMS – ZTEC 231
#### Average time for course completion: 15 hours
- Investment: $395
- LAP 1  Control Logic
- LAP 2  Sequencing Control
- LAP 3  Timers and Advanced Systems

### ADVANCED ELECTRIC MOTOR CONTROLS – ZTEC 208
#### Average time for course completion: 50 hours
- Investment: $1,370
- 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: $325 (Allen Bradley or Siemens)
- LAP 1  Introduction to Electrical Control Wiring
- LAP 2  Electrical Control System Wiring
- LAP 3  Pneumatic Control Circuit Wiring

### PLC AND VFD ELECTRICAL CONTROL WIRING - ZTEC- 267
- Average time for course completion: 5 hours
- Investment: $175
- Prerequisite ZTEC 209  Electrical Control System Wiring

These courses have an open start date. Contact Judith Vecchio at 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
## Electrical Control, Rotating Equipment, Drives

### Basic Electrical Rotating Machines - ZTEC 206
- **Average time for course completion:** 32 hours
- **Investment:** $910
- **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:** $265
- **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:** $385
- **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:** $699
- **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

### Control Panel Wiring - ZTEC 260
- **Average time for course completion:** 15 hours
- **Investment:** $395 (includes Allen Bradley and Siemens)
- **LAP 1** Introduction to Electrical Control Wiring
- **LAP 2** Electrical Control System Wiring
- **LAP 3** Pneumatic Control Circuit Wiring

### Electrical Fabrication - ZTEC 253
- **Average time for course completion:** 12 hours
- **Investment:** $270
- **LAP 1** Introduction to Electrical System
- **LAP 2** Residential Wiring System Components
- **LAP 3** Service Connections and Circuit Protection

### Electro-Fluid Power System - ZTEC 303
- **Average time for course completion:** 40 hours
- **Investment:** $1,055
- **LAP 1** Introduction to Electrical Control Systems
- **LAP 2** Basic Control Devices
- **LAP 3** Power Devices
- **LAP 4** Control Relays
- **LPA 5** Sequencing Control
- **LAP 6** Timer Control
- **LAP 7** Pressure Control Applications
- **LAP 8** Circuit Applications

### Electronic Sensors - ZTEC 304
- **Average time for course completion:** 8 hours
- **Investment:** $265
- **LAP 1** Introduction to Electronic Sensors
- **LAP 2** Electronic Sensor Applications

### Power & Control Electronics - ZTEC 252
- **Average time for course completion:** 50 hours
- **Investment:** $1,340
- **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:** 35 hours
- **Investment:** $985
- **LAP 1** Introduction to AC Drives
- **LAP 2** Configuring A-B PowerFlex 70 Drives
- **LAP 3** A-B PowerFlex 70 Control Parameters
- **LAP 4** Communications and Diagnostics for A-B PowerFlex 70 Drives
- **LAP 5** Troubleshooting A-B PowerFlex 70 Drives
- **LAP 6** Configuring and Troubleshooting the A-B PowerFlex 40 Drive
- **LAP 7** Configuring and Troubleshooting Servo Drives

### DC Electronic Drives - ZTEC 401
- **Average time for course completion:** 30 hours
- **Investment:** $830
- **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.
PLC ALLEN-BRADLEY PANELVIEW PLUS 7 LEARNING SYSTEM - ZTEC 408
Average time for course completion: 15 hours
Investment: $420
LAP 1  Introduction to PanelView Plus 7
LAP 2  PanelView Plus Application Editing 1
LAP 3  PanelView Plus Application Editing 2

PLC ALLEN-BRADLEY CONTROLOGIX ETHERNET - ZTEC 411
Average time for course completion: 25 hours
Investment: $580
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: $420
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: $420
LAP 1  Industrial Communications Networks
LAP 2  Remote Input/Output
LAP 3  Produced/Consumed Data and Messages

PLC ALLEN-BRADLEY COMPACTLOGIX - L16 ZTEC 454
Average time for course completion: 80 hours
Investment: $2,230
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: $580
LAP 1  Introduction to PLC Troubleshooting
LAP 2  PLC Systems Troubleshooting
LAP 3  Analog Input/Output Troubleshooting
LAP 4  Analog Application Troubleshooting

These courses have an open start date.
Contact Judith Vecchio at 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
PLC SIEMENS S7-300 LEARNING SYSTEM WITH TROUBLESHOOTING - ZTEC 412
Average time for course completion: 80 hours
Investment: $2,230
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: $580
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: $405
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: $420
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: $175
LAP 1 - Remote Input/Output

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

AC/DC ELECTRICAL SYSTEMS ZTEC 205 AND ELECTRIC MOTOR CONTROL ZTEC 207 ARE PREREQUISITE COURSES FOR PLC TRAINING.
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: $1,460
**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: $1,270
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: $845
**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: $1,515
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

Individual courses - upgrade your skills

These courses have an open start date. Contact Judith Vecchio at 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
MOTOMAN MERIT CERTIFIED
ROBOT FS100 BASIC PROGRAMMING
WITH MATERIAL HANDLING
ZTEC 556
Average time for course completion: 32 Hours

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

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

INTRO TO MOTOMAN FS100 BASIC
PROGRAMMING WITH MATERIAL HANDLING
ZTEC 559
Average time for course completion: 8 Hours
Investment: $415

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

SUPERVISORS AND MANAGEMENT

INTRO TO FANUC® ROBOTS WITH
HANDLING TOOL SOFTWARE
ZTEC 554
Average time for course completion: 8 Hours
Investment: $415

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

These courses have an open start date.
Contact Judith Vecchio at 610.372.4721, ext 5716 or jvecchio@racc.edu for details.
Supporting the Training Needs of Pennsylvania’s Companies for More Than 20 Years! Formed in 1999 and funded by the Pennsylvania Department of Community and Economic Development, WEDnetPA is the primary delivery system for the Commonwealth’s incumbent worker training program. Each year, WEDnetPA serves more than 700 companies and tens-of-thousands of employees, strengthening these businesses and improving Pennsylvania’s economy.

Company Eligibility

- Must be located in Pennsylvania.
- Must be in an eligible industry cluster, commercial/industrial in nature and not limited or explicitly defined as ineligible in full guidelines.
- Maximum grant amount is $2,000 per employee, up to $100,000 per company per fiscal year.
- Company can only receive funding two years in a row or three out of a five year period.

Employee Eligibility

- Must be a resident of and employed in Pennsylvania.
- Must earn at least $12.00 per hour, excluding benefits.
- Must be permanently employed full-time and eligible for full-time benefits.
- Must be an employee of the specific company location for which a grant is awarded.

Eligible Training

- Must be skill building for current job or advancement.*
- All of RACC’s Options include third-party providers, WEDnetPA partners and qualified in-house staff.
- Must start on or after July 1, 2024 and be completed on or before June 30, 2025. Partial training cannot be reimbursed.
- Cost must be “reasonable” as defined in complete guidelines.
- Each course must be a minimum of 30 minutes in length.

* Courses in this catalog are eligible for WEDnet reimbursement.

Contact David Lerch to discuss detailed company guidelines and to start the application process for funding. 610.372.4721 x6208 or WEDnet@racc.edu
OSHA COMPLIANT SAFETY TRAINING TAUGHT AT YOUR FACILITY OR ONLINE

- OSHA 10 + 30 HOUR - GENERAL INDUSTRY
- LOCKOUT/TAGOUT
- MACHINE GUARDING
- FALL PROTECTION
- CONFINED SPACE
- FIRE EXTINGUISHERS
- INCIPIENT FIRE BRIGADE

Customized training at your facility!

For more information contact Pandora Mazzo at pmazzo@racc.edu or call 610.372.4721 Ext. 5312

CPR Training for your Workforce

CPR custom training options include:

- Training at organization sites day or evening
- Training on RACC Campus for organizations and individuals

New to the RACC’s American Heart Association Training Center - Basic Life Support Classes in Spanish.

Our Workforce Team delivers custom training solutions that meet your needs. Contact Auria Bradley at abradley@racc.edu or call 610.372.4721 Ext 5120
ESL for the Workplace
Time: 10 – 12 Weeks
Customized training at your facility

This training is designed to improve English language skills for employees that are non-native English speakers. ESL for the Workplace focuses on engaging employees in conversations to help them communicate more effectively with confidence in the workplace. This training is structured in a way to help employees improve reading, writing, and speaking English, which leads to increased productivity and builds a better rapport with co-workers. Training can be customized to meet company needs which can include specific workplace scenarios. Call today for more information.

Spanish for the Workplace
Time: 4 Weeks
Customized training at your facility

Spanish for the Workplace is an introductory training that focuses on Basic Spanish language skills for the workplace. This training is designed to help bridge the gap between English and Spanish speaking supervisors and co-workers leading to more effective communication. Spanish for the Workplace can be customized to meet the needs of real-life workplace scenarios and processes. Spanish language skills training can include basic workplace conversations, job expectations and performance discussions, Safety and Emergency dialogs, and many more scenarios. These sessions also include an introduction to the Hispanic Culture.

For more information contact Auria Bradley, Associate Vice President, Workforce and Continuing Education at abradley@racc.edu or call 610.372.4721 Ext. 5120

“Reading Truck partnered with the Workforce and Continuing Education team at RACC to upskill our employees and bridge the communication gap in our workplace. Reading Truck utilized the 8 week workplace scenarios. As a member of our leadership team, I appreciate the collaboration and opportunity the professional language development program provides to develop the necessary language skills to assist with retention, recruitment, and safety. All of which help Reading Truck become an employer choice in a competitive labor environment.”

Michael Fischetti, VP of HR, Reading Truck
**Skill Building for Supervisors and Team Leads**

*Time: 7 Hours  
Price: $595  
Date: 2/15/24 and 4/18/24*

This workshop presents new supervisors and team leads with proven best practices to successfully coach and lead highly productive teams. The supervisor / team lead will learn how to understand and supervise different generations. Understanding this allows the new supervisor / team lead to coach effectively, give and receive constructive feedback using the proper communication skills, conflict management for dealing with difficult behaviors, and effective time management strategies.

To register go to: sttc.eventbrite.com | For a customized training at your facility contact Pandora Mazzo at pmazzo@racc.edu or call 610.372.4721 Ext. 5312

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**Business Communications/Time Management**

*Time: 7 Hours  
Price: $595  
Date: 4/4/24*

Effective communication and efficient time and task management are two critical disciplines required for a successful business environment. This workshop provides business personnel with the skills and tools to deliver clear and concise written and verbal communication and enable them to identify and adjust messaging to the behavior style of their audience. Additionally, attendees are provided with tools and methods to prioritize tasks and increase productivity.

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Diversity, Equity, & Inclusion Training
Customized training at your facility

DEI training aims to create a more harmonious workplace by increasing employee's knowledge and awareness of cultural, religious, or racial differences while delivering information about how a person can change their behavior to be more inclusive. Attendees will explore and challenge their own beliefs and unconscious biases about diversity, and acknowledge discrimination so they can apply the DEI commitment to daily practices and policies in the workplace. This training is customized for your company.

For more information contact Auria Bradley, Associate Vice President, Workforce and Continuing Education at abradley@racc.edu or call 610.372.4721 Ext. 5120

The Highly Productive Leader
Time: 12 Hours (three, 4-hour sessions)
Price: $795

This workshop follows a process that develops an effective style of leadership that positively influences and changes those you work and interact with, yourself, and your entire organization.

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

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Consultative Selling

Time: 7 Hours  
Price: $595  
Date: 5/2/24

Consultative Selling is a complex process that entails a lengthy Sales cycle, multiple decision makers and a level of risk for the buyer. This workshop provides Sales personnel in a consultative role with practices, skills, tools and a framework to effectively engage customers throughout the complex Sales process and develop mutually beneficial solutions.

Delivering Superior Customer Service

Time: 7 Hours  
Price: $595  
Date: 3/5/24

Highly functioning Customer Service teams are viewed by their customers as partners, not simply suppliers. The ability to effectively represent your company to the customer and the customer to your company is a competitive differentiator that requires skilled and aligned customer service team members. This workshop provides all customer facing personnel with skills, best practices and tools to enable them to deliver service excellence by managing customer expectations and building customer relationships.
Train the Trainer

Time: 7 Hours
Price: $595
Date: 2/29/24

Being a subject matter expert does not necessarily imply the capability to train others. The ability to effectively “train others to train” is a force multiplier for any business and requires the knowledge and skills to both develop and deliver effective and meaningful instruction. This workshop provides subject matter experts with the tools, skills and best practices to develop other trainers in an adult learning environment and expand their organization’s training capacity.

To register go to: sttc.eventbrite.com | For a customized training at your facility contact Pandora Mazzo at pmazzo@racc.edu or call 610.372.4721 Ext. 5312

One-on-One Performance Coaching

Customized training at your facility

Performance coaching can help identify an employee’s growth, as well as help plan and develop new skills. Our Certified Coaches meet one on one with employees for

• Behavior Change Wellness & Stress Management
• Leadership Development
• Succession planning
• Performance Improvement Plans (PIPs)
• Culture Development and much more

For more information contact Pandora Mazzo at pmazzo@racc.edu or call 610.372.4721 Ext. 5312
Wellness in the Workplace
Customized training at your facility
3 sessions – 4 hours each

Topics:
- Introduction to workplace wellness
- Assessment of personal wellness profile
- Multi-dimensional approach to wellness focusing on the 6 key areas of human well-being:
  » Physical wellbeing
  » Emotional wellbeing
  » Career wellbeing
  » Social wellbeing
  » Financial wellbeing
  » Community wellbeing
- Specifics such as nutrition and ergonomics
- Building a personal toolbox for wellbeing
- Stress Management and Resiliency building
- Workplace wellness buddies and ongoing support ideas

Employer Benefits:
- Fosters the development of healthy work cultures
- Enhances employee morale, job satisfaction, and teamwork
- Engages employees and helps increase productivity
- Helps reduce absenteeism
- Promotes employee retention
- Enhances corporate image, customer stewardship, and social responsibility
- Positions company as “Employer of Choice” – healthy work cultures attract to talent
- Advances industry recognition (i.e. healthy workplace awards)
- Provides wellness solutions and support for an aging workforce
- Promotes safe work practices and helps reduce workforce injuries

Employee Benefits:
- Heightens awareness, increases knowledge, and expands abilities to improve/maintain personal and family health
- Boosts morale and job satisfaction
- Fosters improved focus and concentration
- Enhances energy levels that contribute to improved productivity
- Helps reduce personal health care costs
- Helps reduce workplace stress and workplace injuries
- Enriches team relationships
- Amplifies overall health and wellbeing

Instructor:
Laural Miller has teamed up with Workplace Wellness Center for Excellence to become a Certified Executive Wellness Coach. In this certification she can offer wellness programs like the one listed above all the way up to Executive Wellness Coaching and entire company culture change.

To register go to: sttc.eventbrite.com
For a customized training at your facility contact Pandora Mazzo at pmazzo@racc.edu or call 610.372.4721 Ext. 5312
Lean Six Sigma Boot Camp

White Belt, 32 Hours - $1,995  
Yellow Belt, 40 Hours - $3,225  
Green Belt, 80 Hours - $4,345  
Black Belt, 120 Hours - $5,995  
Customized training at your facility

** Contact Pandora Mazzo for Breakout Session Pricing.

Our Lean Six Sigma Boot Camp solves real problems in real time at your facility. Up to 120 hours of experienced, in-person and interactive training. Change and continuous improvement is a process. It begins with having the necessary skills, tools and techniques to lead a team through a project and to actively and professionally participate in continuous improvement. The Lean Six Belt classes will provide the tools, skills and techniques needed to assist you in becoming a leader in facilitating Lean and continuous improvement. Select a Belt Boot Camp Belt Certification or have a breakout session by select any of our fifteen sessions.

Solve real problems in real time at YOUR FACILITY.

“Yuasa is very pleased with the projects our White Belt employees completed during their training, and the positive results it has made in our production area. Things are a lot neater and more orderly, as they should have been prior to the completion of this White Belt training. We are looking forward to our next set of upcoming classes and know that we will have the same positive results as we did in our first set of classes.”

Christine Wheelen  
Director of Human Resources  
Yuasa Inc

For more information contact Pandora Mazzo at pmazzo@racc.edu or call 610.372.4721 Ext. 5312
"The continuous improvement culture techniques we were so expertly taught will enable us to add to the already realized benefits and continue to add to them well into the future..."

Kevin Gallen
Vice President Operations
Ethosource LLC

Belts
- Introduction to Lean Principles, Strategies & Techniques (8 Wastes)
- Kaizen Events (Plan, Conduct & Follow-up)
- 6S Workplace Organization Kaizen
- Lean Daily Management (SQDC)
- Root Cause & Corrective Action (8D)
- Six Sigma - DMAIC (Define–Measure–Analyze–Improve–Control)
- Kanban Pull Systems (PFEP)
- Continuous Flow (Cellular Layouts)
- Quick Changeover (SMED)
- Total Preventive Maintenance (TPM)
- Lean Leader / Facilitator / Coach (LFC)
- The Eight Steps of Value Stream Management (VSM)
- Six Sigma – Statistical Process Control (SPC)
- Creating a Continuous Improvement Culture (Kata)
- Policy Deployment / Hoshin

Workshops

** Contact Pandora Mazzo for Breakout Session Pricing. 

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The STTC center at RACC is an AUTHORIZED TRAINING PARTNER of PMI.

**PMI sets the Global standard for Project Management**

The Project Management certification program is designed for managers and supervisors involved in engineering, research and development, data processing, manufacturing, corporate planning, finance, and marketing.

- **In person instruction by an accredited trainer**
- **Participants are provided 250 PMP prep practice questions**
- **PMI Licensed Course content**

Module 1 - Creating a High Performing Team
Module 2 - Start the Project
Module 3 - Plan the Project
Module 4 - Lead the Project Team
Module 5 - Support the Project: Team Performance
Module 6 - Close the Project

**TUESDAYS**
January 23, 2024 through March 5, 2024
8AM - 1PM / $1,995

To register go to: sttc.eventbrite.com

For more information contact Pandora Mazzo at pmazzo@racc.edu or call 610.372.4721 Ext. 5312
CAREER CERTIFICATE PROGRAM

WASTEWATER TREATMENT PLANT OPERATOR

- CERTIFICATION PROGRAM -

What’s Your Goal?
If your goal is to join the field of Wastewater Treatment as a Plant Operator, obtain your certification as a licensed plant operator, or earn continuing education units to maintain an existing certification, then RACC’s Wastewater Treatment Plant Operator Program will get you on the right path.

We Help You Get There With...
- Instructors who are certified operators and/or subject matter experts
- Class size of 30 students or fewer
- Engaging classroom experiences
- Field trips to better understand treatment processes discussed in class

Program Description
Reading Area Community College offers a 180-hour certification program designed to prepare new operators for licensing in the high-demand field of wastewater treatment plant operators. The curriculum for the program was developed by the Pennsylvania Department of Environmental Protection (DEP). This program will prepare students for the DEP’s operator certification exams. Combining this program with work at a local treatment facility will prepare students for licensing.

What You Will Learn
The Wastewater Treatment Operator program combines course work, on-site visits to facilities with classroom components, interactive class discussion with current certified operators, out-of-class assignments, and module-end exams. The program utilizes DEP-approved curriculum that is taught by certified operators and other qualified instructors. The course components also offer continuing education units (contact hours) necessary for certified operators to maintain their certifications.

Career Outlook (from U.S. Bureau of Labor and Statistics)
PA median annual wage - $57,550
Wastewater operators employed in PA - 5,850

Admission Requirements
- Graduate of an approved secondary school or hold a high school equivalency diploma (GED)
- Commitment to attendance policies and program requirements

Class info
Tues. & Thu. 6 PM – 9 PM
January 21, 2024 - 90 Hour Spring Program, $1,495
August 13, 2024 - 90 Hour Fall Program, $1,495

Want To Learn More?
Contact David Lerch at dlerch@racc.edu or call 610-372-4721 ext. 6208
WHY UPSKILL YOUR EMPLOYEES?

- Improved employee retention
- Increased employee engagement
- Increased productivity
- Boosted employee morale
- Increased ability to promote from within

“The only thing worse than training your employees and having them leave is not training them and having them stay.”

– Henry Ford