www.rmctc.org

The Engineering & Automation Technology Program

CIP 15.0403

Instructors: Brian Potteiger
bpotteiger@rmctc.org

Have Questions?
Reading Muhlenberg Career & Technology Center
2615 Warren Rd
Reading, PA 19604
Telephone: 610-921-7310

READING MUHLENBERG CAREER & TECHNOLOGY CENTER

MISSION STATEMENT

The Reading Muhlenberg Career & Technology Center, in partnership with our diverse community, sponsoring districts, and business and industry, is committed to providing quality career and technical education, resulting in opportunities for students to gain employment, pursue post-secondary education, and develop an appreciation for lifelong learning.

VISION STATEMENT

To empower Reading Muhlenberg Career & Technology Center students with the technical knowledge and skills to confidently pursue a career.

BELIEFS

- We believe in valuing the diversity of each student
- We believe education leads to opportunity
- We believe quality education starts with quality leadership
- We believe a career and technical education is a critical component of workforce development
- We believe technology is vital to learning and will help students connect with a rapidly changing world
- We believe technology must be embraced by teachers as a tool to help prepare students to meet current and future labor market demands
- We believe in providing all students with a positive educational experience
- We believe students should feel proud of what they have accomplished each day
- We believe students will be provided the opportunity to achieve their highest potential
- We believe students will be provided the opportunity to acquire and cultivate leadership skills
- We believe in providing students with a safe school environment
- We believe the success of a student is enhanced by parents and/or other influential adults through their support and involvement
- We believe in encouraging students to maintain a lifelong affiliation with the school
- We believe change is an ongoing process, not an event, and is fundamental for building quality programs of study
- We believe instruction must accommodate individual student learning styles

Dear Parent/Guardian,

Please support me in placing a major emphasis on safety with your child. Safety and general working procedures have been carefully established in the engineering and automation laboratory. Such procedures help to prevent unnecessary wear on the equipment in addition to safeguarding students from serious bodily injury. These procedures are outlined and reviewed with each student as follows:

1. Students are to observe the demonstration of proper operation of the equipment by the instructor and must complete the subsequent equipment safety checklist.
2. Students must wear the proper safety attire while working with equipment and at all times in and around the laboratory.
3. Students must consider all safety requirements and think about safety while working in the laboratory area.

Please be aware…failure to follow any of the safety considerations outlined will result in lost laboratory and working time. Any negligent action on the part of a student which may result in damage to equipment **will be the responsibility of the student/parent when it is determined a student failed to follow proper procedures**. While I do not foresee any problems, I respectfully ask you to stress the importance of following proper laboratory procedures with your son/daughter. The safety of your son/daughter is of utmost concern to me, but I cannot ensure their safety if they fail to follow the procedures I have established.

If you have any questions regarding safety, classroom procedures, this specific situation, or anything relating to our engineering laboratory, please do not hesitate to contact me for any reason at any time throughout the school year! You are always welcome and encouraged to call, e-mail, or even visit our classroom at any time.

I look forward to a great school year with the students!

Sincerely,

Brian Potteiger
Instructor
Engineering and Automation Technology
(610) 921-7300 Ext. 7423
bpotteiger@rmctc.org

READING MUHLENBERG CTC

Engineering & Automation Technology

Please sign below to indicate that you have received this correspondence and understand laboratory protocols (student signature), and parents, that you have likewise reviewed my concerns with your son/daughter (parent signature).

Thank you!

STUDENT:

By signing the form below, I acknowledge that I have read and I fully understand the engineering laboratory safety guidelines. I will abide by them at all times and be responsible for my actions.

Print Name: _____

Student Signature: _____ **Date**: _____

PARENT:

By signing the form below, I acknowledge that I have read and I fully understand the engineering laboratory guidelines. I will reiterate the importance of following the safety rules and guidelines outlined above to my child.

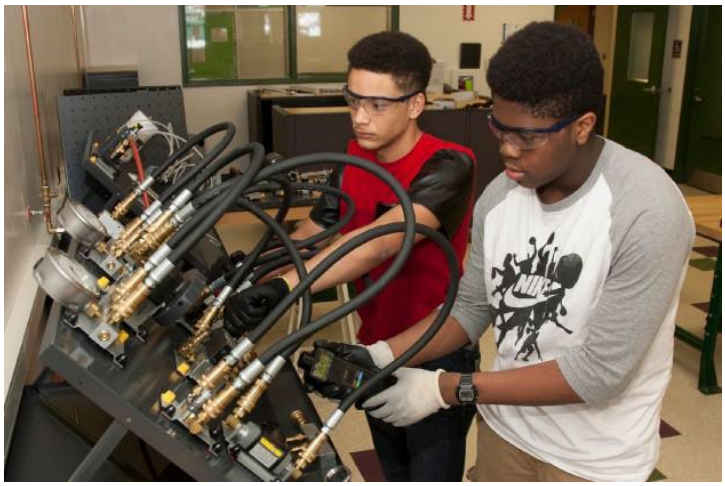
Print Name: _____

Parent Signature: _____ **Date:** _____

NOTE: Please retain the letter for your records and return the signature form to me.

Engineering & Automation

- Develop the knowledge of diverse engineering systems, including electrical, mechanical, hydraulic, pneumatic, and PLC controls.
- Learn test equipment, soldering techniques, design and troubleshoot mechanical and electrical systems, motor controls, and PLC technology.
- Effectively apply problem-solving and leadership skills in a field that offers a multi-disciplinary approach to product and manufacturing system design.
- Enroll in a challenging and rewarding program leading to “high priority” jobs right here in Berks County or continue onto a post-secondary college of your choice.



Job Titles – Career Pathways

17-3023 Electrical and Electronics Engineering Technicians
17-3024 Pre-Electromechanical Technician
17-3026 Pre-Industrial Engineering Technician 17-3027 Mechanical Engineering Technicians 49-9041 Industrial Machinery Mechanics
49-9042 Industrial Maintenance and Repair Mechanic 49-9098 Installation, Maintenance, and Repair Workers

CTC knowledge transfers to college credits at:

Clarion University of Pennsylvania
Harrisburg Area Community College
Northampton Community College Reading Area Community College
*Earn up to 29 dual enrollment college credits with Reading Area Community College through participation in the Technical Academy.

Student Certifications

NOCTI – National Occupational Competency Testing Institute Certification
* Electromechanical Engineering Technology
AMIST Certification – Level I
AMIST Certification – Level II (Technical Academy Level 3 Students Only)
OSHA Safety Certification

OSHA

Instructor – Mr. Brian Potteiger

Biography

I am a proud graduate of Reading Senior High School. In my 37-year engineering career, I worked with incredible technology and witnessed the advancement of many Electro-Mechanical Technologies. As I approached the end of my engineering career, I contemplated what to do next and I often thought about teaching, but what would I teach – physics, calculus, chemistry? Then an opportunity presented itself at RMCTC to teach the Engineering & Automation Technology Program. The curriculum in the program aligned very nicely with my professional engineering experience. I accepted the position and thoroughly enjoy teaching Electro-Mechanical Technology to future engineers and technicians. I reside in the Temple area with my wife, Lori. We have 13 grandchildren and enjoy spending time with all of them. I am a Philadelphia sports teams' fan and I enjoy exercising and weight-lifting.

Education
Bachelor of Science, Mechanical Engineering,

Penn State UniversityMaster of Science, Engineering Science, Penn State University

Certifications and Awards
Professional Engineer, Commonwealth of Pennsylvania

OSHA-10 General Industry Safety

Granted twelve (12) – United State Patents

Intern Certificate, Career & Technical Education

Work Experience
Over the past five (5) decades, I have had the opportunity to work with highly educated and skilled individuals from around the world. I worked with state-of-the-art technology, developed automated assembly processes, designed/built automated equipment, and supported contract manufacturing facilities around the globe. I was granted twelve (12) U.S. Design Patents. I worked as a Technical Manager, supervising a team of engineers, conducted internal audits for global compliance to ISO 9000, and co-authored/published several technical papers. I am proficient in CAD, PLC programming, electrical-mechanical design, statistical process control, and technical documentation.

Hire Date
2022

Program Planning Tool

Program Title: **CIP 15.0403 ENGINEERING & AUTOMATION TECHNOLOGY** Student Name: _____

This document has been designed as a tool to facilitate student placement decisions and provides important information about the program. The chart on the reverse side is designed to assist in the identification of necessary skills, present educational levels, and supports, if any, that are needed to foster program success.

Program Completion Requirements

A successful student will…

- Secondary Academic Course Requirements: The PA Dept. of Education's focus is to ensure every student is college and career ready, therefore all students are recommended to follow a college prep sequence of academic classes. Courses such as applied math or general science are not appropriate for this program. PDE's goal is to have all students perform at the competent or advanced level on the Keystone Exams and Program of Study end-of-program assessment (NOCTI).
- Complete an Occupational Competency Assessment (i.e. NOCTI end-of -program exam) and score at the "competent" or "advanced" level. This end-of -program exam will cover the full scope of the program of study curriculum and includes (1) a multiple choice test and (2) a performance test consisting of occupational related tasks scored and evaluated by industry judges.
- Earn a minimum of one industry recognized certification. Students will be encouraged and expected to earn all recognized industry certifications that make up the scope of the curriculum. Accommodations are not permitted for industry certifications. These include OSHA and AMIST
- Complete the approved program curriculum and earn a minimum of one RMCTC Job Title aligned with the student's career objective. Job titles are identified on the program task list, aligned with local workforce needs and high priority employment occupations, and annually reviewed and approved by the program's occupational advisory committee.
- Successful completion of Keystone Exams as determined by sending school district.
- Maintain a 95% attendance rate or better.
- Transition on to a post-secondary institution, military or related fulltime employment aligned to their CTC program of study.

Instructional Process/Specifications

A successful student will…

- Perform a wide variety of tasks in a laboratory environment with equipment consistent with industry standards. Up to 25 students are assigned to work "independently" and in "small teams". Students progress by using learning guides in a self-directed manner.
- In the lab, students are required to use measuring tools and operate various equipment including grinders, lathes, milling machines, drill presses, hand and power tools, and trainers. Students will also work with chemicals including cutting oils, solvents, and coolants. Using equipment requires self-discipline and strict adherence to rules to ensure safety of self and others. The lab simulates a real working environment therefore students will be exposed to the noise levels, dust, debris, and fumes. Using equipment requires self-discipline and strict adherence to rules to ensure safety of self and others. Students will be exposed to the high noise levels, dust, debris, chemicals and fumes.
- Participate in classroom theory and laboratory applications for generally 2 ½ hours each day; students will spend 40% of their time in classroom theory and 60% of their time doing laboratory applications and live work.
- Participate in Career & Technical Student Organizations including SkillsUSA and/or National Technical Honor Society.
- Participate in a paid or unpaid work based learning related to the Program of Study (cooperative education, clinical internship, and/or job shadowing).
- Complete written and performance tests. Students will be evaluated weekly on occupational skill performance using rubrics. In addition, students will be evaluated daily on work ethics. Progress is measured by test performance, task completion and work ethic.
- Read and study textbooks and technical manuals. Most textbooks & manuals are written at a 12^{th} – 13^{th} grade reading level.
- Complete homework on time. Homework typically involves chapter or workbook assignments, on line research assignments and writing assignments.
- Purchase appropriate work and safety attire, tools, and equipment.

Program Planning Tool

CTE Requirements	Present Educational Ability/Level	Support Needs
Program Completion – Strong self-determination skills and understanding of personal strengths and weaknesses. Ability to meet industry established standards of performance, complete the program of study without curriculum modifications, and earn industry certifications without testing accommodations.		
Reading & Language Arts Level- Text and manuals written on a 12th-13th grade reading level. Proficient on end-of-course exam (Keystone). Effective communication skills in reading and writing and speaking so self and others can clearly understand. Ability to read drawings, specifications and blueprints to prepare patterns and layouts. NOCTI assessment and industry certification exams require a proficiency in English language skills.		
Math Level - At grade level and proficient on end-of-course exam (Keystone). Knowledge of arithmetic, algebra, geometry and their applications. Ability to apply construction geometry; calculate board and square feet; convert fractions, decimals, and percents; simple measurements. Ability to do precise measuring and dimensioning according to blueprints and drawings. Ability to use math to solve problems.		
Aptitude – Mechanical, active listening, complex problem solving/trouble shooting, critical thinking, mathematical reasoning, inductive reasoning, spatial relations. CAD software and computer estimation software.		
Safety & Physical – Arm / hand steadiness, hand-eye coordination, fine motor skills, quick reaction time, near vision, multi-limb coordination, trunk strength, oral comprehension and expression. Ability to stand for long periods of time. High degree of self-discipline and focus needed for safety around moving equipment, hand tools, power tools and other equipment found in the industry. Physical strength and stamina with the ability to lift 50 lbs. overhead. Good eye/hand coordination, stamina to stand for long periods of time.		
Interpersonal/ Social – The ability to work independently or as part of a team. The ability to talk with, listen to and satisfy a customer's needs.		
Other Occupational/Program Considerations – Self-discipline a must due to safety issues. Learning and work environment includes various chemical, odors, dust, dirt and debris, loud and sometime startling noises, and ongoing background noise.		

Scope and Sequence Engineering & Automation Technology 15.0403

Reading Muhlenberg Career & Technology Center

Academic Subjects – Career success and postsecondary education success require the same level of college prep coursework. The Pennsylvania Department of Education's (PDE) focus is to ensure that every student is prepared for college and a career. Academic courses such as applied math or general science cannot be listed on the program's scope and sequence. PDE's goal is to have all students perform at the competent or advanced level on the PSSA, and earn the Pennsylvania Skills Certificate on the end-of-program assessment.

	Secondary School				Postsecondary Institution			
Subject (Hours)	**Grade 9 (Hours)**	**Grade 10 (Hours)**	**Grade 11 (Hours)**	**Grade12 (Hours)**	**First Semester**	**Second Semester**	**Third Semester**	**Fourth Semester**
Technical		Demo Knowledge of Tech Reports	Direct Current (DC) Motors	Mechanical Power Transmission System Industry				
		Demo Safety in the Lab	Alternating Current (AC) Motors	Troubleshoot & Repair Mechanical Power Trans Syst				
		Interpret Elec Symbolism Blueprints & Schematics	Electrical Motor Controls	Fluid Power Systems				
		Dem Know of Basic Elec & use Nat Elec Code (NEC)	Basic Logic Functions	Robotics / Rotation Electrical Machines				
		Measure Components of Electric Systems	Programmable Logic Controls	Job Seeking/Keeping Skills				
		Intro to Shop Machinery	Job Seeking/Keeping Skills					
		Industrial Mechanics						
		Job Seeking/Keeping Skills						
English	College Prep English 9	College Prep English 10	College Prep English 11	College Prep English 12				
Math	Algebra I	Geometry	Algebra II	Trigonometry				
Science	Accl Integrated Science	Biology	Chemistry	Physics				
Humanities	Citizenship	World Cultures	American History I	American Government				
Other	Physical Education	Physical Education	Physical Education	Physical Education				
	Health	Health	Driver's Ed Theory					

15.0403 Electromechanical Technology/Electromechanical Engineering Technology

100 - 100 Technical Reports
101 - Complete technical reports.
102 - Identify the common components of technical documents.
103 - Maintain a daily journal or timecard.
200 - Safety in the Laboratory
201 - Practice accident prevention.
202 - Practice safe work habits.
203 - Use hand tools.
204 - Use portable power tools.
205 - Use a drill press.
207 - Identify electric shock hazards.
209 - Use fire extinguishers for different classes of fires.
210 - Collect Safety Data Sheets (SDS) information.
211 - Follow arc flash protection and National Fire Protection Administration 70E.
212 - Execute lock out/tag out procedure.
300 - Electrical Symbols on Blueprints and Schematics
301 - Interpret electrical symbols, notes, details, and components on schematics.
302 - Draw schematics for electrical circuits.
400 - Basic Electricity
402 - Describe the application of a magnetic force.
403 - Describe the atomic structure for materials.
404 - Describe the direction of electron flow in circuits.
405 - List the effect of electric current flow.
406 - Construct simple circuits.
407 - Define voltage, current, resistance, and power.
410 - Describe the characteristics and purposes of good conductors of electricity.
411 - Use prefixes in the metric system of measurement.
413 - Follow Ohm's law.
414 - Follow Watt's law.
500 - Electrical Systems Measurements
501 - Use an analog and a digital multimeter to measure voltage, amperage, and resistance.
502 - Use a non-contact voltage tester to detect voltage.
503 - Perform a continuity test.
600 - National Electric Code (NEC)
601 - Follow regulations for wiring.
602 - Follow NEC code for sizes and types of wire conductors, raceways, andboxes.

603 - Follow NEC rules for grounding and bonding.
604 - Follow NEC rules for over-current protection devices.
605 - Locate the NEC code for motor circuit wiring.
606 - Use the NEC reference book to locate regulations for industrial electrical installations.

700 - Electrical Resistance
701 - Define resistance.
702 - Identify resistor materials.
703 - Describe how length and thickness of wire affect resistance.
705 - Calculate resistance of a wire.
707 - Explain power and heat dissipation in a resistor.
710 - Identify components of a potentiometer and rheostat.
715 - Identify values for color-coded resistors.
800 - Direct Current (DC) Motors
802 - Apply the theory of operation of a direct current motor.
803 - Operate and test a series, shunt, and compound direct current motor.
805 - Perform calculations for horsepower, speed, and torque for direct currentmotors.
806 - Measure performance and efficiency of a direct current motor.
807 - Use technical terms to describe the construction of direct current motors.
808 - Determine the operations of variable speed control for direct current motors.
900 - Inductance and Capacitance
901 - Connect a capacitor in a circuit.
902 - Calculate the time required to charge and discharge a capacitor.
903 - Identify capacitive and inductive circuits.
904 - Calculate total capacitance and inductance of series and parallel circuits.
905 - Perform calculations for capacitive and inductive reactance.
906 - Analyze the effect of an inductor in a direct current and alternating currentcircuit.
907 - Analyze the effect of a capacitor in a direct current and alternating current circuit.
1000 - Alternating Current (AC) Motors
1001 - Explain the theory of operation of alternating current motors.
1002 - Calculate the synchronous speed of an alternating current motor.
1004 - Connect and operate split-phase, capacitor-start, capacitor-run, and dual capacitor motors.
1005 - Reverse the rotation of a split phase, capacitor-start, capacitor-run, and dual capacitor motors.
1007 - Determine operating characteristics of universal motors.
1008 - Connect and operate a three-phase, squirrel cage motor.
1009 - Reverse the rotation of a three-phase motor.
1100 - Series-Parallel Circuits
1101 - Build and test a series circuit.
1102 - Build and test a parallel circuit.

1103 - Build and test a series/parallel circuit.
1104 - Troubleshoot series and parallel circuits.
1105 - Calculate voltage, current, and resistance.
1106 - Measure voltage, current, and resistance.

1200 - Electric Motor Controls
1201 - Identify symbols and terms used in electromechanical motor control circuits.
1202 - Identify relays, contactors, and motor starters.
1203 - Read schematic wiring diagrams of motors and their controls.
1204 - Wire a simple two- and three-wire motor control circuit.
1205 - Wire a reversing starter.
1206 - Wire multiple push button/jogging control circuits.
1207 - Wire sequential control circuits.
1208 - Wire and test electrical control circuits.
1209 - Perform preventive maintenance and troubleshooting on motor controls.
1212 - Use conductor ampacity to select wire size and wire type for a specific wiring application.
1213 - Label control and power wiring.
1215 - Connect and operate alternating current and direct current variable speeddrives.
1300 - Transformers
1301 - Connect and operate a transformer.
1302 - Calculate the voltage-and-turns ratio.
1303 - Connect a step-up and a step-down transformer in a circuit.
1304 - Identify transformer windings and related output voltages.
1305 - Calculate volt-amps of a single-phase and three-phase transformer.
1306 - Measure single-phase transformer voltage and currents.
1307 - Measure series/parallel transformer voltages and currents.
1308 - Demonstrate knowledge of three-phase transformers.
1309 - Wire and analyze three-phase transformers.
1400 - Soldering Techniques
1401 - Use and care for soldering equipment.
1402 - Implement soldering techniques for splicing conductors.
1403 - Implement soldering techniques for terminals.
1404 - Remove and install components on a printed circuit board.
1500 - Troubleshoot and Repair Electrical Devices
1501 - Troubleshoot and repair motor controls.
1502 - Troubleshoot and replace relays.
1503 - Troubleshoot and replace sensors.
1504 - Troubleshoot and replace limit switches.
1505 - Troubleshoot and replace power supplies.
1507 - Troubleshoot alternating current and direct current variable speed drives.
1600 - Basic Electronics
1601 - Interpret electronic symbols shown on diagrams and schematics.
1602 - Identify the function of diodes.
1603 - Identify the function of Zener diodes.
1604 - Identify the function of transistors.
1605 - Identify the function of power supplies.
1606 - Identify the function of filters.

1607 - Identify the function of half-wave, full-wave, and three-phase rectifiers.
1608 - Identify the function of thyristors.
1609 - Identify the function of single-phase and three-phase inverters.

1700 - Basic Logic Functions
1702 - Convert between binary, BCD, octal, hexadecimal, and decimal numbersystems.
1706 - Construct logic circuits containing and, or, nand, nor, and not gates.
1707 - Create truth tables for and, or, nand, nor, and not logic.
1800 - Programmable Logic Controls (PLCs)
1801 - Explain where programmable logic control (PLC) networks may be used in the manufacturing process.
1802 - Identify the parts and operating principles of PLCs.
1803 - Use number systems and codes for PLCs.
1804 - Create a relay logic diagram.
1805 - Create PLC logic gate functions in PLCs.
1806 - Explain PLC logic and math functions.
1807 - Explain PLC timer and counter functions.
1808 - Explain PLC jump, compare, and sub-routine functions.
1809 - Edit PLC programs.
1810 - Troubleshoot a PLC system.
1900 - Mechanical Power Transmission Systems
1901 - Use vocabulary words and terms associated with the fundamental principlesof the transmission of mechanical power.
1902 - Construct simple machines and use them to illustrate mechanical principles.
1903 - Lubricate bearings.
1904 - Install and adjust belt, chain, and gear drives.
1905 - Use brakes and clutches.
1907 - Set and adjust mechanical stops.
1908 - Calculate speed and torque rates of mechanical equipment components.
2000 - Troubleshooting and Repair Mechanical Power Transmission Systems
2007 - Troubleshoot and repair or replace speed-reduction units.
2008 - Troubleshoot and repair or replace clutches.

2100 - Fluid Power Systems
2101 - Interpret electrical and electronic control circuit symbols and schematics for hydraulic systems.
2103 - Identify fundamentals of hydraulics.
2104 - Connect and operate various pumps.
2105 - Identify types of hydraulic fluid transmission and conditioning.
2106 - Measure oil flow and oil pressure.
2107 - Operate manual and pilot operated directional control valves.
2110 - Construct, test and troubleshoot hydraulic control circuits.
2121 - Perform adjustments to control oil temperature and pressure.
2122 - Conduct routine preventive maintenance on hydraulic equipment in accordance with manufacturer instructions.
2123 - Identify electrical symbols/schematics for pneumatics.
2124 - Apply the fundamental principles of pneumatics.
2125 - Describe the characteristics of air compressors.
2126 - Identify systems used for the distribution and conditioning of air.
2127 - Measure and control air flow and air pressure.
2128 - Identify pneumatic actuators.
2129 - Operate and explain mechanical devices that operate on air pressure.
2130 - Construct, test, and troubleshoot a pneumatic circuit.
2131 - Analyze pneumatic circuits.
2132 - Identify where electronic switches and sensors may be found in pneumatic systems.
2133 - Interpret electric control circuits and devices in pneumatic systems.
2134 - Sketch flow path symbols and air logic schematics.
2135 - Interpret flow path symbols and air logic schematics.
2136 - Select and use properly sized pneumatic piping.
2137 - Use dampers, thermostats, switches, pneumatic positioners, linkageassembles and accessories in pneumatic systems.

2200 - Troubleshoot and Repair Fluid Power Systems and Their Components
2204 - Install, troubleshoot, repair or replace, and adjust pressure regulators.
2205 - Install, troubleshoot, and repair or replace airlines.
2206 - Install, troubleshoot, repair or replace, and adjust pumps.
2207 - Install, troubleshoot, and repair or replace gauges.
2208 - Install, troubleshoot, repair or replace, and adjust cylinders.
2209 - Install, troubleshoot, and repair or replace filters.
2210 - Install, troubleshoot, repair or replace and adjust control valves.
2211 - Install, troubleshoot, and repair or replace actuators.
2212 - Install, troubleshoot, repair or replace, and adjust pressure switches.
2213 - Install, troubleshoot, repair or replace, and adjust relays.
2216 - Conduct routine preventive maintenance on pneumatic equipment in accordance with manufacturer instructions.
2217 - Install, troubleshoot, and repair or replace, hydraulic lines.
2218 - Install, troubleshoot, repair or replace, and adjust hydraulic pumps.
2219 - Install, troubleshoot, and repair or replace hydraulic gauges.
2220 - Install, troubleshoot, and repair or replace hydraulic filters.
2221 - Install, troubleshoot, and repair or replace hydraulic directional controlvalves.
2222 - Install, troubleshoot, repair or replace, and adjust hydraulic pressure controlvalves.
2300 - Robotics
2301 - Follow safety rules and regulations for working around robots.
2302 - Use vocabulary words and terms specific to robotics.
2303 - Identify major systems of a robot.
2304 - Identify a robot?s work envelope in a manufacturing cell.
2306 - Determine the operation of a robot's drive system.
2307 - Determine the mobility of an industrial robot.
2308 - Program a robot.
2309 - Use a robot for industrial applications.
2400 - Works Cells in a Manufacturing System
2401 - Identify the fundamental operating principles used in flexible manufacturing systems.
2500 - Raceway Systems
2501 - Cut, bend, and install conduit or tubing.
2502 - Install raceway or wire duct.
2600* - EMPLOYABILITY SKILLS
2601* - Establish Career Goals.
2602* - Complete Job Application.
2603* - Compose Resume.
2604* - Prepare for Job Interview.
2605* - Compose Employment Letters.
2606* - Participate in Online Job Search.
2607* - Prepare Career Portfolio.
2608* - OSHA certification
2609* - AMIST level I

2700* - PRINCIPLES OF MECHATRONICS
2701* - Connect and operate photoelectric sensors.
2702* - Connect and operate proximity sensors.
2703* - Identify electro-pneumatic hardware and components.
2704* - Connect and operate basic electrically controlled pneumatic circuits.
2705* - Connect and operate advanced electrically controlled pneumatic circuits.
2706* - Design an electrically controlled pneumatic work system.
2707* - Identify PLC hardware and components.
2708* - Program and operate a fixed type PLC.
2709* - Operate and position a DC motor system utilizing a PLC.
2710* - Control pneumatic actuator cycles utilizing a PLC.
2711* - Count pneumatic actuator cycles utilizing a PLC.
2712* - Design a PLC controlled fluid power system.
2713* - Design and program a Human Machine Interface (HMI) application.
2714* - Design and build a flexible manufacturing system utilizing machine vision.
2715* - Design and build a flexible manufacturing system utilizing servo motor controls.
2716* - Design and build a fully functional flexible manufacturing production line.

STUDENTS OCCUPATIONALLY & ACADEMICALLY READY

- *Earn college credits which will save you money on tuition*
- *Shorten college attendance*
- *Get on the right career path*
- *Enter the job market prepared*
- *Get a consistent education*
- *See your CTC School Counselor for More Information*

TO QUALIFY CTC STUDENTS MUST:

1. Earn a high school diploma, achieve a minimum 2.5 GPA on a 4.0 scale in your CTC program and complete the PDE approved Program of Study.
2. Earn the industry certifications offered by your program (if applicable).
3. Achieve Competent or Advanced on the NOCTI End of Program Assessment.
4. Achieve proficiency on ALL of the Program of Study Competency Task List.
5. Provide documentation to Postsecondary Institution that you have met all of the requirements!

Find out more about the colleges offering course credits you can earn while attending RMCTC. Go to collegetransfer.net, search: PA Bureau of CTE SOAR Programs, and find your program by CIP Code.

CollegeTransfer.net
Find your way

**To receive college credits, qualifying students have three years from their date of graduation to apply and matriculate into the related career and technical program at a partnering institution.*

GRADE REPORTING

Purpose: The intent of this grading procedure is to provide a student grade that accurately reflects student achievement. Progress is measured in the areas of work ethics, knowledge and the practical skills aligned to the program area learning guides. Student performance for learning guide activities and assignments are reflected in the knowledge grade. Students will be evaluated according to established program standards on an individual basis. The student information system automatically calculates student grades using the following formula:

Work Ethic	40%
Knowledge	60%
	100%

Teachers must be able to justify grade percentages in the event of inquiries or concerns.

Interpreting a Grade:

Work Ethics Grade (40%): Each school day, every student receives a Work Ethics or daily grade. Criteria that compromise these grades are safety, student behavior, preparation/participation, productivity or time on time on task, professional appearance and extra effort. The Work Ethics grade range is based on a 0 to 10 model that students may earn each day depending on how many criteria they criteria they satisfactorily meet.

NOTE: Impact of Absenteeism, Tardiness/Early Dismissals – The direct effect of absenteeism on a student's grade will be through the Work Ethic component of the grading formula. If a student is Tardy or has an Early Dismissal the Work Ethic can reflect a deduction in points earned for that class period. The instructor may change this value as they see fit.

Knowledge Grade (60%): Throughout the marking period, a student's cognitive knowledge about various career-specific topics will be evaluated and recorded by the instructor. Examples of knowledge activities include: lab/shop assignments, homework, quizzes, tests, and research activities. The knowledge grade range is based on actual points earned divided by the total accumulative points.

Skill (Learning Guide): A task list guides every RMCTC program. Tasks are evaluated on a scale with a 4 or 5 considered proficient. Learning guides are normally aligned to lab assignments or shop projects where a student will physically perform a task. The student and teacher will discuss, at the beginning of each quarter, student expectations and the required tasks that must be completed or "contracted" by the end of the marking period. This allows a student to work productively with the expectation to make constant progress during the marking period. All assignments, activities and rubrics associated with learning guides are documented in the "knowledge" grading component. It is important to note that poor productivity will have a negative impact on a student's grade.

NOTE: For the purpose of students earning a job title associated with their program area, teachers track students' skill/task work. Teachers identify specific criteria to evaluate each task performed, ranging from a 0 to 5 (not completed to mastery). Students must earn a 4 or 5, in order to credit the task towards earning the specific job title. Students have the opportunity to revisit a task multiple times until successfully receiving credit. The job titles a student earns will be listed on the student's RMCTC certificate that is awarded at Senior Recognition Night.

Student grades will be reflected as a percentage, and will be reported directly to the student's sending school to be added to the report cards.

Final Grade average is based on the student's four (4) numerical marking period grades.

If a student has three (3) marking period grades of "F" consideration will be given to that student not passing for the year. If a student is on an **upward trend** at the end of the school year, this **may** justify having the student pass for the year. If the opposite is true, and the student is on a **downward trend**, the student may be asked to select a new program or return to the sending school on a full-time basis.

The individual teacher must evaluate each student's achievements in terms of the expected goals for their program area.

Failure to complete assignments, frequent lateness or absence, and demonstrated indifference to school are major contributors to student failures. **Blatant refusal** to attempt or to complete a significant number of course requirements may lead to poor performance and possible removal.

The following divisions are given as a guide to recording and interpreting the grading system. It remains for each teacher to objectively and fairly rate each student, not based upon personality, but performance.

Determination of Grades: Teachers will give thorough consideration using all grading components in determining students' grades to both class work and test results.

A = Excellent

1. This grade represents **superior work** and is distinctly an honor grade.
2. The excellent student **has reached all course objectives** with high quality achievement.
3. The excellent student displays unusual effort and works willingly and effectively in reaching required objectives.

B = Good

1. This grade represents **above average** quality achievements.
2. The good student **has reached a large majority of course objectives.**
3. The good student is industrious and willing to follow directions.

C = Average

1. This grade represents **satisfactory** achievement.
2. The average student h**as reached a majority of course objectives.**
3. The average student is cooperative and follows direction, yet extra effort and improvement are needed for more complete mastering of the material.

D = Passing

1. This grade represents a **minimally satisfactory** achievement.
2. The failing student **has not reached necessary course objectives.**
3. This achievement level indicates there is a great need for improvement, daily preparation and improved dedication and attendance.

F = Failure

1. This grade represents **unsatisfactory** achievement.
2. The failing student has **not reached necessary course objectives.**

Incomplete Grades: Incomplete grades must be updated no later than ten (10) days from the close of the marking period. As soon as the work is completed and the grade is available, it must be reported to the appropriate person.

Failures: Students who receive a failing final grade in a program area are permitted to repeat that program, but are urged not to do so. If this situation presents itself, students and parents are advised to consider an alternative program which is probably more suited to the student's true interests and aptitudes are not merely satisfying a short-term or unrealistic desire.

Attendance and its Impact upon Grades: The importance of regular school attendance and its positive impact upon students' performance grade cannot be overstated. If a student is absent, he or she does not have the opportunity to keep pace with their classmates and must work independently to acquire the information missed during any absence. Regardless of how well a student performs when he/she is present, habitual absenteeism usually results in a failing performance grade. This situation is not unlike the conditions of the business or industry for which the student is being trained.

Makeup Work for Absences: Students have the opportunity to make-up schoolwork due to an illness/being absent from school. Students must submit make-up work within the following timelines:

1. One (1) to three (3) days excused absence – five (5) school days to complete assigned work.
2. Four (4) or more days excused – ten (10) school days to complete assigned work. All work missed through unexcused absences will be graded zero (0).

Report Cards (see Progress Reports): Students will receive a report card from the sending school district which will reflect the student's grade from their Career & Technology classes. Students will also receive a report card from RMCTC reflecting their program grade and Social Studies grade, where applicable. In addition, grades are available on the parent portal.

Student Recognition Night: Reading Muhlenberg Career & Technology Center hosts an annual Student Recognition Night, which honors our senior students. During this event, senior students in attendance are recognized and may also receive awards that they have earned relevant to their accomplishments while attending Reading Muhlenberg CTC.

CAREER & TECHNICAL STUDENT ORGANIZATIONS (CTSO)

All students enrolled in Reading Muhlenberg Career & Technology Center have the opportunity to participate in at least one Career & Technical Student Organization (CTSO) while enrolled at the CTC. Students who become members in these co-curricular organizations have the opportunity to participate in team building, leadership, community service and social events.
Students also have the opportunity to attend skill competitions where the skills they have learned are "put to the test" against other competitors. These competitions include testing of knowledge and hands-on skills in a variety of trade and leadership events. Students who are fortunate enough to win their events at a district or state competition are able to compete at the national level and travel to locations such as Louisville, KY, Kansas City, MO, San Diego, CA, Orlando, FL, and Cleveland, OH.

SkillsUSA

http://skillsusa.org

SkillsUSA is a national organization of students, teachers and industry representatives who are working together to prepare students for careers in technical, skilled and service occupations. SkillsUSA provides quality education experiences for students in leadership, teamwork, citizenship and character development. It builds and reinforces self-confidence, work attitudes and communications skills. It emphasizes total quality at work, high ethical standards, superior work skills, life-long education, and pride in the dignity of work. SkillsUSA also promotes understanding of the free-enterprise system and involvement in community service.

National Technical Honor Society (NTHS)

www.nths.org

NTHS is the acknowledged leader in the recognition of outstanding student achievement in career and technical education. Over 2000 schools and colleges throughout the U.S. and its territories are affiliated with the NTHS. Member schools agree that NTHS encourages higher scholastic achievement, cultivates a desire for personal excellence, and helps top students find success in today's highly competitive workplace.
NTHS members receive: the NTHS membership certificate, pin, card, window decal, white tassel, official NTHS diploma seal, and three personal letters of recommendation for employment, college admission, or scholarships. Students will have access to our online career center including these valuable services: MonsterTRAK, Wells Fargo, Career Safe, and Career Key.
.

READING-MUHLENBERG CAREER & TECHNOLOGY CENTER

WORK BASED LEARNING
Cooperative Education & Internships
RULES / GUIDELINES

1. All Work Based Learning (WBL) students must have school WBL forms completed and sign up for the school Remind App before starting the job/internship. Any student who is less than 18 years of age must also have a transferable work permit.

2. **ABSENT FROM SCHOOL????? – NO WORK!!!!!!!!**

   - If you are absent from school in the morning, you may **NOT** go to work in the afternoon. **YOUR JOB IS PART OF YOUR SCHOOL DAY**. If you are at a **medical, social service, or court appointment** in the AM, you **may** go to work that day. However, you must bring a note **from the agency where you were**, to your attendance secretary, the next school day.

   - If you are ill, **YOU** must call your employer to inform him/her that you will not be reporting for work.

   - **IMPORTANT**: If your name is going to appear, for any reason, on your sending school absentee list, you must also **report off to Mrs. Albarran @ 610-921-7301. Failure to report off may result in removal from WBL.**

   - If **school is closed** for a holiday, in-service day, or a snow day, you **DO** go to work on those days, if you are scheduled. If you are not scheduled, you can work additional hours if your employer allows you to work. Labor Laws need to be followed.

   - If you are suspended **out of school,** you may not work at your WBL job. This includes jobs that are scheduled with after school hours.

   - **REPETITIVE ABSENCES** at school or work will result in your removal from Work Based Learning.

3. All WBL students are required to **report to the CTC every Monday**. Any additional classroom time is at the discretion of your program area teacher. You are responsible for communicating this to your employer. On the **first Monday of each month** or **the first day, you are at RMTC for the month**, you must report to the **Work Based Learning Office**, where you will sign in with Mrs. Hughes. Co-op students will record hours and earnings, and then return to your program area for the remainder of the school day**. Do not forget to bring your check stubs to record your hours and earnings!** Internship students will record hours. **If you miss two monthly meetings, you will be removed from WBL.**

   - Any violations of these rules will result in the following **discipline action:**
     1st violation – VERBAL WARNING
     2nd violation – REMOVAL FROM WORK BASED LEARNING

4. When at work, you are guided by and are responsible to your employer. Be sure to follow all of the Employers' rules and regulations because you will be terminated for the same reasons as any other employee. Upon your first week of work, obtain a contact number in case you need to call your supervisor.

5. If your work experience is terminated for any reason, you must return to school the next day, and inform your CTC teacher and the Work Based Learning Coordinator**.**

6. If you wish to terminate your employment, you must discuss this with your teacher and the Work Based Learning Coordinator, and leave the job properly by giving the employer a two-week notice and a letter of resignation.

7. If you have any questions concerning the rules and guidelines of Work Based Learning, please contact the WBL coordinator at 610-921-7337.

STUDENT SIGNATURE

PARENT/GUARDIAN SIGNATURE