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## **3D Manufacturing Technology Program**

**CIP 48.0501**

Instructor: Daryl Davis

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Have Questions?

Contact: Mrs. Donna Henderson– School Counselor

Reading Muhlenberg Career & Technology Center

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# **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

## 3D Manufacturing Technology

Dear Parent or Guardian,

Welcome to the Reading Muhlenberg Career & Technology Center, I am pleased to have your son / daughter as a student in the 3D Manufacturing Technology Program.

The 3D manufacturing program has full size industrial equipment to prepare students for a career in the machining industry. Safety is the first and most important subject covered in the 3DT program. Students are required to take and pass safety tests before they are permitted to use the equipment. Students are also required to have the proper clothes for working in the shop. Students are required to wear steel toed work shoes, long pants, (No Shorts), a short sleeve shop uniform shirt which can be purchased at the school, and wear safety glasses at all times in the shop.

The student will be graded daily on work ethic, this 40% of their grade. The work ethic grade is based on attendance, safety, amount of work done, shop skills, and care and clean up of shop and equipment.

The student will also be graded on knowledge; this is 60% of their grade. On a daily basis lessons on machine shop theory, blueprint reading, shop math and skills are covered to prepare students for a career in the machining industry. Students will have written assignments, tests, and quizzes in order to measure the student knowledge level.

I am looking forward to working with and helping your son / daughter to be successful in the 3D Manufacturing Technology program.

If you have any questions or concerns, please feel free to contact me.

I can be contacted by email at [ddavis@rmctc.org](mailto:ddavis@rmctc.org) and by phone at (610) 921-7300 ext.7428.

Thank you I look forward to meeting you, and working together to help your son /daughter to be successful.

Sincerely,  
Daryl Davis  
3D Manufacturing Technology Teacher



# 3D Manufacturing Technology

- Machine parts on equipment found in the industry, such as engine lathes, milling machines, and state-of-the-art (CNC) Computer Numerical Control machines.
- Receive industry-recognized certifications from (NIMS) National Institute for Metalworking Skills.
- Acquire the knowledge needed to enter into employment, apprenticeship programs, and/or post-secondary education.
- Position yourself to work in an in-demand, highly skilled, high-paying machining career.



## Student Certifications

National Institute for Metalworking Skills (NIMS) Level I

- \* Measurement, Materials & Safety
- \* Job Planning, Benchwork & Layout
- \* Drill Press
- \* Manual Milling
- \* Manual Turning Between Centers
- \* Manual Turning with Chucking
- \* Turning Operations: Turning Chucking Skills
- \* CNC Turning: Programming Setup and Operation
- \* CNC Milling: Programming Setup and Operation
- OSHA Safety Certification

## Accreditations

National Institute for Metalworking Skills



## Job Titles – Career Pathways

- 51-4011 Computer-Controlled Machine Tool Operators, Metal and Plastic
- 51-4012 Numerical Tool and Process Control Programmers
- 51-4034 Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
- 51-4035 Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic
- 51-4041 Machinists
- 51-4111 Tool and Die Makers
- 51-4199 Metal Workers and Plastic Workers, All Other
- 51-9061 Inspectors, Testers, Sorters, Samplers, and Weighers

## CTC knowledge transfers to college credits at:

Butler County Community College  
Clarion University of Pennsylvania  
Luzerne County Community College  
Pennsylvania College of Technology  
Reading Area Community College  
Thaddeus Stevens College of Technology  
Welder Training and Testing Institute  
Westmoreland County Community College



## **Instructor – Mr. Daryl Davis**

### **Biography**

I have always been interested in how things work, which directed me towards how to make things and into the machinist trade. My goal as an RMCTC teacher is to pass along as many of the skills that I have learned to the next generations of machinists. I am married and have two children. In my free time, I enjoy ice hockey, boating, motorcycling, and building & flying remote control airplanes.

### **Education**

1980 Graduate of Boyertown High School

1980 Graduate of Berks East Vocational School – Machinist/Toolmaker

Business courses at RACC

Currently enrolled at Temple University to obtain my teaching certification

### **Certifications & Awards**

PA State Certified Journeyman Machinist

### **Work Experience**

40 years of experience in the machining trade, from entry-level to shop manager for various companies.

### **Hire Date**

2020



# Program Planning Tool



Program Title: CIP 48.0501 3D MANUFACTURING 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 (NIMS).
- Complete an Occupational Competency Assessment (i.e. NIMS 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 four 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: National Institute for Metal Working Skills (NIMS): Level I Machining, Level II Machining, Job Planning, Benchwork & Layout, Manual Milling Skills, Drill Press Skills, Grinding Skills, Turning Operations: Turning Between Centers, Turning Operations: Turning Chucking Skills, CNC Milling: Programming Setup & Operations, CNC Milling: Programming Setup & Operations and Wire EDM II.
- 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 through using learning guides in a self-directed manner.
- In lab, students will be required to use precision measuring tools, operate grinders, lathes, milling machines, drill presses, hand tools, band saws, surface grinders, CNC milling machines, CNC lathes, CNC wire electrical discharge machines, machinist microscopes, CAD/CAM milling and turning programs. Students will 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 and students will be exposed to the noise levels, dust, debris, and fumes associated with a modern precision machining environment.
- Participate in classroom theory and laboratory applications for generally 2 ½ hours each day; students will spend 20% of their time in classroom theory and 80% 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 are written at a 11<sup>th</sup> to 13<sup>th</sup> grade reading level and most technical manuals are written at a higher 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
<b>Program Completion</b> – 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.		
<b>Reading &amp; Language Arts Level</b> - Text and manuals written on a 11 <sup>th</sup> -13 <sup>th</sup> grade reading level. Proficient on end-of-course exam (Keystone). Understanding written sentences and paragraphs in work related documents. Must have ability to read blueprints, wiring diagrams, schematic drawings, and engineering instructions. NIMS assessments and industry certification exams require a proficiency in English language skills.		
<b>Math Level</b> - At grade level and proficient on end-of-course exam (Keystone). Knowledge of arithmetic, algebra, geometry and their applications. Ability to make calculations relating to dimensions, tooling, feeds and speeds of machinery. Ability to calculate dimensions and tolerances using knowledge of mathematics and instrumentation. Ability to use Cartesian coordinates.		
<b>Aptitude</b> – Mechanical, design skills, problem solving and trouble shooting skills, attention to detail, thinking creatively, critical thinking.		
<b>Safety &amp; Physical</b> – 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.		
<b>Interpersonal/ Social</b> – Active listening, general communication skills, ability to work independently and in a team.		
<b>Other Occupational/Program Considerations</b> - 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 3D Manufacturing Technology 48.0501

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)	Grade 12 (Hours)	First Semester	Second Semester	Third Semester	Fourth Semester
Technical		Fundamentals and Safety	Blue Print Interpretation & Measurement	CNC-Vertical Milling	MTT 113: Basic Metalworking I	CIM 101: Basic Machine Tool Programming	CIM 123: CNC Programming and Machining	CIM 205: Electrical Discharge Machining
		Blue Print Interpretation, Measurement & Bench work	Lathe	CNC Turning Center	MTT 114: Metalworking II	MTT 123: Machining Processes	MTT 210: Tool Technology	CIM 220: CAD/CAM
		Pedestal Grinder & Band Saw	Milling Machine	CNC Wire Electrical Discharge Machine	MTT 116: Lathe Applications I	MTT 126: Metrology/Quality Control		MTT 215: Abrasive Machining and Heat Treatment
		Drill Press	Surface Grinder	CAD/CAM Programming	MTT 117: Lathe Applications II			
		Lathe	Inspection	Certification				
		Milling Machine	CNC-Concepts	Job Seeking/Keeping Skills				
		Surface Grinder	Certification					
		Job Seeking/Keeping Skills	Job Seeking/Keeping Skills					
English	College Prep English 9	College Prep English 10	College Prep English 11	College Prep English 12		ENL 111: English Comp I	SPC 201: Interpersonal Communications	
Math	Algebra I	Geometry	Algebra II	Trigonometry	MTH 180: College Algebra and Trig I	MTH 182: College Algebra and Trig II		
Science	Accl Integrated Science	Biology	Chemistry				PHS 114: Physics w/Technological Applications	
Humanities	Citizenship	World Cultures	American History I	American Government				_SSE: Elective: Social Science
Other	Physical Education	Physical Education	Physical Education	Physical Education	SAF 110: Occupational Health and Safety			
	Health	Health	Driver's Ed Theory					



# 48.0501 Machine Tool Technology/Machinist

## **ORIENTATION / SAFETY**

Describe the Occupational Safety and Health Administration (OSHA) and its role in the machining industry.

Apply general safety procedures.

Review Safety Data Sheets (SDS).

## **PERFORMING LAYOUT WORK**

Perform layout work.

Employ basic and precision layout tools.

## **PART INSPECTION**

Employ precision measuring instruments.

Calibrate precision measuring instruments.

Conduct quality control procedures.

## **BENCH WORK**

Apply bench work safety procedures.

Cut material with a hand hacksaw.

File work to specifications.

Cut threads with hand taps and dies.

Use hand tools.

Use a hand arbor and/or hydraulic press.

## **DRILL PRESSES**

Apply drill press safety procedures.

Operate drill press work holding devices.

Select correct drill sizes for drill press application.

Demonstrate counterboring spotfacing and countersinking.

## **GRINDING MACHINES**

Apply pedestal and surface grinding safety procedures.

Identify parts of pedestal grinder.

Test mount and dress grinding wheels.

Grind and sharpen tools.

Identify parts of surface grinder.

Grind surfaces flat and parallel using a magnetic chuck.

Grind work surfaces square with a vise or angle plate.

Grind precision angles using a sine plate or sine bar.

## **LATHES**

Apply lathe safety procedures.

Mount and indicate work piece in 3-jaw and 4-jaw chucks.

Align centers.

Face workpiece.

Turn inside and outside diameters to shoulders.

Turn tapers.

Demonstrate knurling.

Part off and groove workpiece.

Cut internal and external threads.

File and polish workpiece.

Perform boring operations.

Install and remove tool holders.

Use a collet attachment.

Select gears for lathe operations.

## **MILLING MACHINES**

Apply milling machine safety procedures.

Tram a milling head.

Mount and indicate vise.

Mill angles.

Mill keyways.

Use an edge finder.

Differentiate between climb milling and conventional milling.

Use an adjustable boring head.

Install and remove cutting tool holders.

Select cutter for milling operations.

Square part.

## **POWER SAW**

Apply power saw safety procedures.

Follow the 3 tooth rule.

Saw work piece.

### **MACHINES AND TOOLS**

Lubricate and maintain machinery.

Clean and store equipment.

Inspect machine guards.

### **METALLURGY**

Identify metals classifications.

Identify metal property applications.

Identify heat-treating and annealing processes.

### **CHARTS AND REFERENCES**

Use the decimal equivalent chart.

Calculate speeds and feeds.

Use tap and drill charts.

Use Machinery Handbook and/or shop references to locate information.

### **BLUEPRINT READING**

Identify orthographic views and projections.

Identify the alphabet of lines and symbols.

Calculate material sizes.

Differentiate angle projections.

Interpret title block information.

### **CNC PROGRAMMING**

Apply CNC safety procedures.

Use G and M codes.

Use of Cartesian coordinate systems.

Prove a CNC program.

Set part zero and tool offsets.

Transfer data files to and from a CNC machine.

use CNC control functions.

### **VALUE ADDED**

80.1 - Establish Career Goals.

80.2 - Complete Job Application.

80.3 - Compose Resume.

80.4 - Prepare for Job Interview.

80.5 - Compose Employment Letters.

80.6 - Participate in Online Job Search.

80.7 - Prepare Career Portfolio.

Identify machine trade careers and occupational outlooks.

Identify machine trade equipment including the advantages and disadvantages of CNC Machining.

Use a coordinate measuring machine.

Identify bolts and fasteners.

Use a D.R.O.

### **CNC Wire Electrical Discharge Machine**

Demonstrate wire electrical discharge machine safety.

Perform preventative machine maintenance for wire EDM.

Select work holding devices for wire EDM.

Set up and run selected programs for wire EDM.

Write and run program - linear interpolation on wire EDM.

Establish and utilize offsets.

### **CAD / CAM Programming**

Identify and interpret CAD / CAM nomenclature.

Draw basic geometry using CAD.

Edit geometry and tool path.

Create and sequence tool paths.

Generate tool paths to code and run CAD/CAM generated program.

# 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](http://collegetransfer.net), search: PA Bureau of CTE SOAR Programs, and find your program by CIP Code.



*\*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.*

# Reading Muhlenberg Career and Technology Center

## 3D Manufacturing Technology

### Classroom Expectations

#### Contact Information

Teacher: Daryl Davis

Phone: 610-921-7300 ext. 7428

Email: ddavis@rmctc.org

#### Expectations

- All students are expected to:
- Show respect
- Be aware of and obey all safety rules
- Learn and work in safe and efficient manner
- Be punctual
- Manage their time in class effectively
- Work on task and only on their assigned projects
- Accept responsibility
- Come to class prepared to learn, and with the necessary materials
- Participate in lectures, demonstrations, and learning activities
- Follow all rules stated in the student handbook

#### ***A brief note about RESPECT.....***

Students are to respect everything in the classroom. This includes: the teacher, your peers, desks, books, tools, equipment, machines.....EVERYTHING!

Students will respect other people's feelings and the opinions of others.

Inappropriate language/behavior will not be tolerated!

## Negative Behavior Consequences

1<sup>st</sup> Occurrence: Verbal warning

2<sup>nd</sup> Occurrence: Teacher-student meeting with rule review & related assignment

3<sup>rd</sup> Occurrence: Phone call to parent or guardian

4<sup>th</sup> Occurrence: Discipline referral

## Homework

Homework will be assigned weekly and checked frequently. These assignments will count toward each marking period grade. Late homework will not be accepted and will be graded as a zero.

### Absences

If a student is absent they will be responsible for the work they miss. It is the **student's** responsibility to obtain and complete any missed assignments.

1. If an assignment, quiz, test or project was announced prior to an absence, you will be expected to turn the assignment in or take the test or quiz the day you return.
2. If you have an **excused** absence the day an assignment is given, you will have 3 days to complete the work upon your return.

## Extra Help

Take advantage of this opportunity whenever possible. If you are having trouble, PLEASE ASK for additional help. Extra help is available through our Learning Resource Center, instructional assistants, and online resources.

## Required Materials

1. Work boots – All students are required to wear work boots when in the Machine Shop Technology Lab.
2. Pencils with eraser

All other materials are supplied by the school.

**\*\*\*\* Please read over these rules and sign at the bottom acknowledging that both the student and parent/guardian have read and understand the expectations and rules of the 3D Manufacturing Technology program. By signing this form, you both understand that if any of the shop rules are broken, appropriate disciplinary action will follow. Please understand that the rules and regulations followed at our schools are in place to allow the students to have a positive learning experience and to stay as safe as possible while under our supervision. We are all looking forward to a wonderful school year!**

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I have read and reviewed the 3D Manufacturing Technology Expectations with my parent/guardian.

Student: Name (Please Print) \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_

Parent/Guardian: Name (Please Print) \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_

Parents: So I can effectively communicate your child's progress in class, please provide me with a current email address and a phone number. If you have any questions or concerns, please contact me at your convenience.

Email Address \_\_\_\_\_

Phone Number \_\_\_\_\_

## Daily Work Ethic Grade

Reading Muhlenberg Career & Technology Center  
3D Manufacturing Technology

Week

Session

Date \_\_\_\_\_

NAME \_\_\_\_\_

	M	T	W	TH	F	TOTAL	COMMENTS
<u>Work Boots</u> Hard leather or steel toe work boots.							
<u>Safety Glasses</u> Safety glasses MUST be worn at all times.							
<u>Safe &amp; Proper Operation of Machines</u> Machines, tools, and equipment must be used for their intended purpose.							
<u>Correct Operation of Machines</u> Use proper feeds, speeds and tooling.							
<u>Proper Shop Attire</u> Shop coats, long pants, short sleeves, all jewelry removed.							
<u>Behavior &amp; Work Ethic</u> Begin work in a timely fashion and stay on task for the duration of the allotted learning time. Horseplay will not be tolerated!							
<u>Language</u> Refrain from inappropriate language. Respect everyone at all times.							
<u>Tools Returned to Proper Location</u> All tools must be returned to their proper place at the end of class. No tools or supplies should be left at machines or on work benches.							
<u>Machine and Floor Clean</u> Proper housekeeping is required. Machines and surrounding floor must be cleaned properly at the end of shop time.							
<u>Proper Use and Care of Computers</u> Computers will only be used with permission. Computers will only be used for their assigned purpose.							
<p style="text-align: center;">Total</p> <p style="text-align: center;">10 Items = 1 pt. each = 10 possible points</p>							



Reading Muhlenberg Career Technology Center  
3D Manufacturing Technology  
Equipment Loan Agreement

The following is a list of tools, and replacement costs, loaned to me by the Reading Muhlenberg Career & Technology Center 3D Manufacturing Technology Program.

These tools are for my use for the current school year. I am responsible to pay restitution for any broken and/or missing tools assigned to me.

Plastic Tool Box # _____	\$ 20.00
Safety Glasses	4.66
Scriber	4.00
Centering Gage (Fish Tail)	11.65
Dividers	11.00
6" Rule	11.70
3" Rule	10.10
1" Micrometer	89.00
Allen Wrench Set	5.39
#4 Center Drill	5.00
1-1/2" Paint Brush	1.00
Shop Coveralls	<u>40.00</u>

TOTAL      \$ 213.50

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date Loaned: \_\_\_\_\_

Signature When Returned: \_\_\_\_\_

Date Returned: \_\_\_\_\_

Teacher's Signature: \_\_\_\_\_

## 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 ClassMate grading software automatically calculates student grades using the following formula:

$$\begin{array}{rcl} \text{Work Ethic} & 40\% & \\ \text{Knowledge} & \underline{60\%} & \\ & 100\% & \end{array}$$

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 comprise these grades are safety, student behavior, preparation/participation, productivity or 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 satisfactorily meet.

**NOTE: Impact of Absenteeism, Tardiness/Early Dismissals –** The direct effect of absenteeism on a students' 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 grade will automatically be defaulted to a five (5) from a possible ten (10) points. 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 0-5 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.

### CTC Letter Conversion Table

<u>Grade</u>	<u>Letter</u>
100 – 97	A+
96 – 93	A
92 – 90	A-
89 – 87	B+
86 – 83	B
82 – 80	B-
79 – 77	C+
76 – 73	C
72 – 70	C-
69 – 65	D
64 – under	F

## **GRADE REPORTING (continued)**

Final Grade average is based on the student's four (4) numerical marking period grades. The final average will directly align to the letter conversion table listed above.

If a student has three (3) marking period grades of "F" the teacher shall give appropriate consideration 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 **should** receive a failing grade.

The individual teacher must evaluate each student's achievement 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 failure. **Blatant refusal** to attempt or to complete a significant number of course requirements may, by itself, justify a final course grade of "F".

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 **has reached a majority of course objectives**.
3. The average student is cooperative and follows directions, 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 student is performing below-average work and **has not reached a majority of 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**.
3. The failing student has not attempted to complete assignments, is constantly late or absent, and generally has failed to accomplish the fundamental minimum essentials necessary in the program area.
4. It may be noted that generally a student does not fail because of a lack of ability; failure may be caused by laziness, non-dedication, or a general disregard to directions of the teacher and the unwillingness to use whatever ability he/she possesses.

**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 for obvious reasons. If this situation presents itself, students and

## **GRADE REPORTING (continued)**

parents are advised to consider an alternative program which is probably more suited to the student's true interests and aptitudes and 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 a student's 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.

**Make up Work for Absences:** Students have the opportunity to make-up school work due to an illness/being absent from school. **PROVIDED** their absence is excused. Students must submit make-up work within the following timelines:

1. One (1) to three (3) days excused absences – five (5) school days to complete assigned work.
2. (4) or more days excused absence – ten (10) school days to complete assigned work.

All work missed through unexcused absences will be graded as a zero

**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. 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](http://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:**
    - 1<sup>st</sup> violation – VERBAL WARNING**
    - 2<sup>nd</sup> 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.

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STUDENT SIGNATURE

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PARENT/GUARDIAN SIGNATURE