

Practicum in CNC Operations

Ben Barber Innovation Academy • C112 • Tim Sherwood • timothysherwood@misdmail.org

SYLLABUS • Fall 2019

1. PURPOSE & PARTNERSHIP

- **The purpose of this course and the course (Practicum of Manufacturing)** is to train a select group of MISD students in the area of Computer Numerical Control (CNC) entry and intermediate machinist skills that will enable them to be viable candidates for open positions within our business community.
- **The partnership for this innovative classroom and onsite learning and mentoring** includes the Mansfield Manufacturing Partnership that includes the *Mansfield Economic Development Corporation, Workforce Solutions for Tarrant County*, and our workplace sponsoring companies: *UTEX, Drill King, and Klein Tools*. Through this partnership, students involved in the CNC program will have opportunities to experience related careers at industry locations within our community. The above local industry partners have agreed to the placement of qualified students during the internship (fall semester) and practicum (spring semester) portion of the CNC program.

2. COURSE DESCRIPTION & OBJECTIVES

- *This course is available to students in 12th Grade. Requirements: Application to Advanced Precision Metal Manufacturing Program, successful completion of Algebra I and Geometry, successful completion of either the Principles of Manufacturing, Construction, Welding, or Automotive courses.*
- *Practicum in CNC Operations (PICO) will enhance the technical knowledge and skills learned in Precision Metal Manufacturing 1 and 2 by allowing students the opportunity to explore career preparation that has resulted from the rapid advances in technology and career demands in high-skill, high-wage opportunities. Practicum In CNC Operations provides the knowledge, skills, and technologies required for employment in a globally competitive manufacturing environment.*
- *This course will address a variety of materials in addition to metal such as plastics, ceramics, and wood. Students will have opportunity to develop concepts and skills used to operate Computer Numerical Control (CNC) machines in order to apply them to personal and professional development – onsite internships and practicums.*
- *This career and technical education supports the student's integration of academic and career and technical knowledge and skills. Students will have opportunities to reinforce, apply, and transfer knowledge and skills to a variety of settings and problems. Knowledge about career opportunities, requirements,*

and expectations and the development of workplace skills will prepare students for future success.

- This 36-week course equals 2 credits upon successful completion.

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1. SCHEDULE & INTERNSHIP ROTATION

- **Weeks 1 to 4 – Ben Barber Campus:** Welcome, introductions, online learning and assessment, instructions, workplace safety, requirements and expectations for course, tours and internships, introduction to CNC and Immerse2Learn training software.
 - 01 **Welcome & Introductions** – Syllabus, Course TEKS, and Requirements & Expectations
 - 02 **Safety:** Begin *Occupational Safety and Health Association (OSHA) General Industry* course
 - 03 **Work Skills:** How to develop and maintain successful work skills and relationships
 - 04 **CNC:** What is Computer Numerical Control? G-Codes? M-Codes? “S” and “F”?
 - 05 **Industrial Sites:** Tours
 - 06 **Internship Expectations/Responsibilities • Internships begin (Tuesdays and Wednesdays).**
 - 07 **I2L: Begin Immerse2Learn CNC Virtual Training Software** (Mondays, Thursdays, and Fridays).
 - A. Course Introduction
 - B. Safety for Machining
 - C. Shop Mathematics Level 1
- **Weeks 7 to 36 – INTERNSHIPS – Tuesdays and Wednesdays:** Students will be assigned to one of the industrial sites. Students will return to class on Fridays of B day weeks.
 - 06 **Internships – Intern Reports are due every Friday the students are back in class.**
- **Weeks 7 to 36 – BEN BARBER CAMPUS – Fridays:** Students will be in class working on projects and work through the online CNC Virtual Training Software module assignments. All modules have comprehensive exams at the end of each module.
 - 07 **I2L: Immerse2Learn CNC Virtual Training Software (cont.)**
 - C. Shop Mathematics Level 1 (cont.)
 - D. Shop Mathematics Level 2
 - E. Reading Manufacturing Blueprints
 - F. Precision Measurement
 - G. Speeds and Feeds
 - H. Machinists Calc Pro
 - I. 3-Axis CNC Milling Machine Setup: Old Control and New Control
 - J. 3-Axis CNC Milling Machine Programming
 - K. Haas Mill Intuitive Programming System
 - L. CNC Lathe Setup: Old Control and New Control
 - M. CNC Lathe Setup Programming
 - N. Haas Lathe Intuitive Programming System

REQUIRED MATERIALS

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SAFETY & CNC MACHINING MODULES – Provided Software & Resources

- Students will use the *Occupational Safety and Health Administration (OSHA) General Industry* online training software to complete and earn their OSHA credential. The fee for the course is paid for MISD.
- Students will use the *Immerse2Learn CNC Virtual Training System (I2L)* for CNC to complete interactive industrial machining (CNC programming and virtual mill, lathe, and grind operations). Students will also use a variety of online resource materials. These materials are provided for by MISD.

Certifications

These certifications are tentative on the progress and completion of the student in the online courses! Students must pass all certification pretests and have an 80% in the class for the district to pay the certifications test fee.

- One (1) Possible OSHA certification

Three (3) possible for 3-Axis CNC Milling Machine and three (3) possible for CNC Lathe Setup.

REQUIRED MATERIALS

- Pen and pencils – Black ink (preferably)
- Closed shoes or steel toe boots
- iPad
- No baggy clothing
- Short Sleeve shirt
- No Jewelry
- **Internships Logbook** - Compositions Notebook - Quad Ruled (9 ¾" x 7 ½") for collecting course notes, materials, and information and as a logbook for student internship learning and experiences. Also for documenting "quality" accomplishments, etc.

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SAFETY

- Students will be using machines used in the industry that can be dangerous if not used properly and not alert and aware of their surroundings at all times. Students and guardians will be asked to sign a form agreeing to the shop safety rules before the student will be released to work in the machine shop area.
- Students will use the *Occupational Safety and Health Administration (OSHA) General Industry* online training software to complete and earn their OSHA credential. The fee for the course is paid for MISD.
- Students will use a combination of both real machining centers, and the *Immerse2Learn CNC Virtual Training System (I2L)* for introduction machining courses like safety, machine controls, hand tools, and more. Students will also use a variety of online resource materials. These materials are provided for by MISD.

Assessment

According to District Policy, a semester's grading periods – three six weeks – will be averaged together for **80% of the overall grade** (actual percentage of total course grade is in brackets). Student grades will be posted in skyward within five business days for major grades and daily grades.

- **Daily Work/Participation/Internships**..... 60 %
- **Major Grade/Performance**.....40 %

NOTE: Final exam is at the discretion of the instructor and will be a mixture of a written test and a project. The project will consist of material that the students will learn throughout the course.

SPECIAL NOTE: To make an 80-above grade, the student must be competent in all required assignments including writing, participation, daily work, and test/quizzes. To make a 90-above grade, the student must be competent in required course work and show "quality" work that has consistently improved throughout the course.

SEMESTER GRADES

A	90-100
B	80-89
C	70-79
F	Below 70

An “Incomplete” (I) reflects incomplete student work and is not considered an academic grade.

*See MISD Board Policy EIC (LOCAL).

- Semester grades are computed for each course by averaging the numerical grades recorded for each of the three six week reporting periods and the course semester exam.
- **All courses** - Semesters One and Two:
 - First and Fourth Six Weeks = 26% each
 - Second, Third, Fifth, and Sixth Six Weeks = 27% each
 - Semester Exam: 20%
- A student in grades 9-12, or in a lower grade when a student is enrolled in a high school credit-bearing course, will earn credit for a course only if the final grade is 70 or above. For a two-semester (1 credit) course, the student's grades from both semesters will be averaged and credit will be awarded if the combined average is 70 or above. Should the student's combined average be less than 70, the student will be required to retake the semester in which he or she failed.

SEMESTER EXAMS

- Each semester, specific exam schedules are designated for MISD high school and dual credit courses. These schedules must be followed. Neither mid-term nor final exams are given early. If a student is absent on the day of an exam he/she will take the exam at a date/time designated by the school. A student is expected to contact the course teacher to schedule a make-up time for a **first semester exam** missed because of student absence. A student is expected to contact the school counseling department to schedule a make-up time for any **second semester exam** missed because of student absence.

ABSENCES & TARDIES

It is your responsibility to get any information missed if absent or tardy. All modules, assignments, internship assignments must be completed and submitted by the final due date or student will earn a “0” (per District Policy). Assignment particulars will be accessible electronically. Verification of completion is also to be made electronically. More information about these resources and procedures will be given to students during the course introduction.

LATE WORK

- Teacher designates due date and time for assignment (Beginning of class period, End of class period, designated time of day)
- If student fails to meet the due date and time, then the student has till the next class period (next A day or B day) to turn in assignment to be considered one day late.
- Students will be assessed a penalty of 30% points for up to one class period late.
- Score of a zero may be given for work turned in after one day late.

MAKEUP WORK (because of absence for any class missed)

- The teacher may assign the student makeup work based on the instructional objectives for the subject or course and the needs of the individual student in mastering the essential knowledge and skills or in meeting subject or course requirements.
- A student will be responsible for obtaining and completing the makeup work in a satisfactory manner and within the time specified by the teacher. When absent, the student is afforded the number of days missed plus one additional day to turn in makeup work. [A/B Block Example: A student misses Monday and Tuesday of the week and he/she returns on Wednesday of that same week. Student work from Monday's absence is considered late after Friday, and student work from Tuesday's absent is considered late after the following Monday.]
- A student who does not make up assigned work within the time allotted by the teacher will receive a grade of zero for the assignment.
- A student is encouraged to speak with his/her teacher if the student knows of an absence ahead of time, including absences for extracurricular activities, so that the teacher and student may plan any work that can be completed before or shortly after the absence.
- A student will be permitted to make up tests and turn in projects due in any class missed because of absence. • Teachers may assign a late penalty to any long-term project in accordance with time lines approved by the principal and previously communicated to students.
- See UIL Eligibility ("No Pass/No Play") guidelines for additional information related to grades and UIL Eligibility.

TEST RETAKES

- Students will be allowed to demonstrate proficiency of learning objectives by means of retest. **This course focuses on mastery/competency and quality. Please see the Student Handbook** for all the details that are involved per District Policy. There is no midterm exam for this course. The final exam – **Quality Assessment Project** – is not included in the retake/retest policy.
- Students who fail a major test/assessment (below 70%) will be allowed to retake or correct up to a 70% grade. This does not include semester examinations.
- Students are expected to make arrangements with the teacher to retake or correct a major test/assessment.
- Students are encouraged to participate in tutoring opportunities before retaking a test.
- Each teacher will communicate routine requirements for retakes and corrections in his/her course syllabus.
- All retakes or corrections must be completed prior to the end of each six week grading period unless the student is afforded time, after the six week grading period, as a result of the district's absent/make-up guidelines.
- See UIL Eligibility ("No Pass/No Play") guidelines for additional information related to grades and UIL Eligibility.

ACADEMIC HONESTY & INTEGRITY

Honesty is extremely important and expected. Teachers determine what constitutes cheating and/or plagiarism.

Consequences for academic dishonesty

Daily Work

- Every

Offense

- Academic and Disciplinary Consequences
- Assign grade of zero
- Write a referral
- Teacher contacts parents
- Consequence from administrator would be a minimum of AC placement

Exams or Other Major Assessments

- Every

Offense

- Academic and Disciplinary Consequences
- Assign grade of zero
- Write a referral
- Teacher contacts parents
- Consequence from administrator would be a minimum of AC placement
- An alternative exam or major assessment can be completed for a maximum grade of 70%

Academic Associate is notified and will schedule a meeting with student, parent and teacher

UIL ELIGIBILITY (“No Pass/No Play”)

- Semester grades are computed by averaging the numerical grades recorded for each of the three six week reporting periods.
- Each six week grading period will stand alone for eligibility purposes.
- A student who is declared academically ineligible after a six week grading period will be able to regain eligibility if all of the student’s grade averages are 70% or higher at the subsequent 3 week grade reporting period.
- See MISD Board Policy FM (LOCAL) – Exempt Courses.

CELL PHONES & ELECTRONIC DEVICES

MISD and BBCTA policy will be followed in relationship to cell phones and electronic devices in the classroom.

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POLICIES

The student and parent must sign the computer rules policy provided by the Mansfield ISD. All district and campus policies will be followed and enforced in this classroom. All industrial site policies will be followed and enforced. Failure to abide by these policies will limit or possibly remove the student from the CNC Program.

CLASSROOM EXPECTATIONS

Our campuses and classrooms provide amazing resources that must be shared. Both you and I will abide by these policies as well as those established by the Mansfield ISD school board policies:

- **Be respectful of oneself** – Come to class and/or the industrial site prepared with your materials and assignments; be dressed and groomed in accordance to school and/or industrial site codes.
- **Be respectful of others** – The focus of this course and internships is on skilled learning and experiences. Distracting behavior is not acceptable.

- **Be respectful of property and equipment** – Clean up after yourself and take care of items that are placed in your care.
- **Be responsible** – Take care of your assignments and other business at appropriate times.
- **Be reliable** – Be prepared and on time for class and/or your industrial site assignment.
- **Be a team player** – You will have plenty of opportunities to team up with others in this course. Do your part, carry your part of the load, and do it with a good attitude.

As an educator, it is my joy to challenge MISD students to go beyond academic excellence, to be open to the challenges of learning, to be well rounded, to be committed to the fair and respectful treatment of others, and to be workers for justice within the community – the sum of the experiences will be the development of men and women who are committed to the principles of leadership.

This is your opportunity to intentionally grow and to help others grow. Give your best effort. Do the quality work. Let's inspire each other to greater heights of personal growth, achievement, and satisfaction.

Make the most of these unique and excellent opportunities offered to you by the **Mansfield ISD / Ben Barber Career and Technology Academy, Mansfield Economic Development Corporation, Workforce Solutions for Tarrant County**, and our Mansfield Manufacturing Partnership that includes (listed alphabetically) ***Cam-Tech, Drill King, and Klein Tools***.

We have 3 industry partners with the CNC Program and growing, which are very gracious to open their doors and provide tremendous jobsite learning experiences for you during this course, as well as providing practicum locations for you during this course (Practicum In Metal Manufacturing). Make sure that you let them know you appreciate them.

We look forward to celebrating with you as you build a solid foundation of learning and experiences that will help open many doors for you in the future.

INSTRUCTOR/ADVISER CONTACT INFORMATION

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