ADVANCED MANUFACTURING SYLLABUS 2022-2023

COURSE INFORMATION

- AM Session: 7:55 AM – 10:25 AM, PM Session: 11:10 AM – 1:40 PM, Monday - Friday
- Credits: 3.0 high school credits per year
- CTE Dual Credit: Everett Community College, MFG T 104 Machine Operator 1 (20 credits)

INSTRUCTOR INFORMATION

Instructor Name: Gary Beach

Office Hours: 7:00 AM - 2:10 PM

Office Location: Building 2, Room 207

Phone: 425-348-2236

Email: beachga@mukilteo.wednet.edu

REMIND: Text @gebf6h to 81010

The best way to contact me is via email or text on REMIND app. Please state your name and students name when leaving a message. I will be happy to answer back with a message or phone call.

COURSE DESCRIPTION

This Advanced Manufacturing course prepares individuals with the technical knowledge, skills, and experiences necessary to successfully enter the manufacturing trade. Instruction includes shop and machine safety practices, industry standards, precision machining, additive manufacturing, blue-print reading, process planning, lean manufacturing, quality assurance, as well as part and fixture design using computer-aided design (CAD). Technical skills will be learned through hands-on experience in all course sections. This knowledge will be supplemented and supported through classwork, tests/quizzes, demonstrations, and examples.

A strong emphasis is placed upon job planning and following manufacturing orders and processes. Shop equipment that will be used and mastered in this class include the manual engine lathe, CNC (computer numerical control) lathe, vertical milling machine, CNC milling machine, tool grinder, sanders, and 3D printer. The importance of quality work is taught through the continual use of precision measuring instruments such as layout tools, calipers, micrometers, and precision gauges to check part features and dimensions.

Instruction is split between academic theory and practical applications. This is a shop-based class with about 80% of the time spend working hands-on in the shop. It is not possible to succeed in this class from in the classroom or with poor attendance. In this pursuit, students are assigned projects which target different machines, techniques, and skills. These projects become more advanced as skills are mastered. These skills are evaluated through project quality and completion as well as in-class tests and quizzes. This course is heavily reliant upon mathematics and spatial orientation. It is critical that the student learn to envision 3D environments and related material science concerning work holding, machine processing, material removal, inter-part relationships, as well as fits and tolerances to be successful. Students will work independently and in teams on projects. In this vein, the student gains experience with teamwork and leadership in a dynamic environment including.

Students will have the opportunity to participate in field trips to local manufacturers and machine shops. There will be guest presenters, job fairs, job search coaching, and interviewing experiences.

Student supplies and requirements*

Required Materials:

- No.2 Pencils and Blue or Black Pens
- Paper-college ruled or graph paper
- USB storage drive 2GB or higher

Recommended Materials:

- Scientific Calculator-Ti-30 or Ti-30xa
- 3-ring binder / folder

Safety and Professional Attire*

Closed toe, sturdy shoes are required**, and pants are recommended. Students will be issued a locker and may choose to keep these items on site. Loose fitting clothing of any kind is not permitted in the shop and long sleeve shirts should not be worn. Safety glasses and hearing protection will be provided.

** steel-toe safety shoes are not required

* Sno-Isle TECH Skills Center can assist any student with financial relief for needed materials or equipment for this course. We are also able to connect you with resources for barriers to school attendance. Please reach out to me as your instructor, or to any staff member for help. Alternatively, use this QR code to access the form the connect you to financial assistance:

COURSE EXPECTATIONS

- Think Critically
- Reason Quantitatively and Symbolically
- Communicate Effectively
- Apply Information Tools and Resources
- Develop Professional and Employability Skills
- Develop Cultural Awareness

LEARNING OBJECTIVES

After completing this course, students will be able to:

- Describe and follow shop safety and shop maintenance protocols.
- Demonstrate professionalism, etiquette and pride in the workforce.
- Identify machining tools [including hand tools] and describe what they are used for.
- Demonstrate the use of the following safety equipment and materials:
  - PPE (personal protective equipment)
  - Tool guards and safety shields
- Identify basic materials that are commonly used in manufacturing and describe the types and forms.
- Interpret basic drawings and blueprints, including lines, dimensioning and tolerances.
- Define 5S, describe lean manufacturing, and Just in Time (JIT) manufacturing concepts
- Create a basic part design fitting within engineering design constraints
- Develop a project plan including selection and preparation of the raw material.
- Utilize basic and precision measuring tools to perform measurements, calculations, and maintain tolerances.
- Demonstrate the following machining skills:
  - Hole finishing
  - Sawing material with excess
  - Surface finish, deburr
  - Tramming mill head
  - Dialing mill vise
  - Loading material
  - Make accurate cuts and square a block
  - Reading mill dials

- Backlash compensation
- Demonstrate climb vs. conventional cutting
- Adhere to print tolerances
- Proper tool selection (cutting, measuring, and hand tools)
- Turning and facing operations
- Calculate and use proper speeds and feeds

COURSE MATERIALS / EQUIPMENT (supplied)

- Textbook: Precision Machining Technology Second Edition
- Computer: Dremel Digilab Slicer, Vericut, Fusion 360, Amatrol E learning Suite
- Shop: Bridgeport style milling machines, engine lathes, CNC lathe, CNC 3-axis mills, band saw, grinders, 3D-printers, tool pre-setter, optical comparator

ASSIGNMENTS AND GRADING

Students will be evaluated and graded as follows:

- **Professionalism** – Daily employability evaluation, safety, and conduct – approximately 60% of course grade
- **Projects** – Completion of projects and demonstration of skills – approximately 30% of course grade
- **Knowledge** – Class assignments, tests, and quizzes – approximately 10% of course grade

Late Work Policy: Projects and Assignments received late will be evaluated for the possibility of full credit. However, this excludes assignments received after the end of a grading period. These assignments will not be accepted.

It is reasonable and possible for EVERYONE to earn EXCELLENT evaluations. Doing poorly in this class will be a result of either not trying or not acting professionally.

Professionalism Standards:

Professionalism will be evaluated on a daily basis using a "Daily Tie-In and Employability Record." This is an industry standard of communication and documentation for daily work and performance. This accounts for the majority of the course grade. Your daily employability grade is based on the Professional Standards of Sno Isle TECH and the manufacturing industry. Every Student will be expected to keep a copy of these Professional Standards and also strictly adhere to them. Sno Isle is preparing you to succeed in a professional work environment and this is the standard you will be held to for employment.

Knowledge Standards:

This is the computer work, book work, and paperwork. In the classroom, we look at the foundation knowledge of manufacturing technology. Students who can think things out will do far better than those who simply memorize the material and "parrot" it back. Getting an "A" grade on a classroom test means nothing if you cannot perform it in the shop. Knowledge retention and performance in the shop is required to succeed in this class and the manufacturing industry. In industry, you will not learn temporary information and skills just to pass a test. You will learn permanent skills that you will be expected to demonstrate daily.

Skill Standards:

Your skill evaluations will be compared to industrial level standards. Various projects and skills will have a weighted value based on the length of time required for a skilled person to complete the project or assignment. The most important factor is having quality work turned in on time. Industry does not accept less than good quality parts completed on time: This is expected at Sno-Isle as well. Industry does not grade parts on a variable scale. A part is 100% acceptable or it is rejected. (Would you fly in a plane built with out-of-tolerance parts?)

Tips for success in this class:

- Always be working on something constructive (never sit around with "nothing to do")
- Be available to assist others who are struggling
- Do not just do the minimum: Go "above and beyond" with shop cleanup, organization, and all activities.
- Each part you make is your signature in manufacturing, always make it your best.

Grading / Curriculum Communication: Students and parents can review the daily class agenda, all assignments, reference materials, and grades online through Mukilteo School District's Schoology account, Schoology is the learning management system used for this course. Access information will be provided at the beginning of the school year.

Special Accommodations:
Sno-Isle TECH Skills Center can support accommodations for learning and health needs. The same as your sending school, we need updated paperwork that states what accommodations are necessary. Please turn in any updates to your learning and accommodation plans to me or the Study Center staff.

ACADEMIC HONESTY AND INTEGRITY

There is zero tolerance for academic dishonesty in this course.

Academic Honesty and Integrity violations include, but are not limited to:

1) Plagiarizing, copying, or submitting any part of another person's work (written, visual, or auditory) as representing one's own work.
2) Distribution/Sharing/Receiving of class assignments or test information in written, electronic, or verbal form to/from another student without teacher permission. Students in physical or electronic possession of unauthorized academic materials, whether requested/used or not, may be subject to disciplinary action.
3) Using "crib notes": Any use of unauthorized notes on tests/assignments (written notes or electronic devices of any kind).
4) Altering or Accessing Official School Documents: A student shall not alter official school documents, either paper or electronic, or open school documents not specifically addressed to the student.

Suspected and confirmed instances of academic dishonesty will be referred to administration for documentation.

PROFESSIONALISM AND CONDUCT

As a student of Sno-Isle TECH in the Advanced Manufacturing class, you are expected to actively pursue a journey that will lead you toward being a responsible, mature, contributing member of our society. It is expected that you will strive to conduct your life in away that brings honor to yourself, your family, your community, and your school. Refer to Sno-Isle's professionalism standards (The 3 R's) for reference of how to carry yourself upward on this journey. Upon entering the workforce, employers expect their employees to work effectively and act professionally.

Electronics Policy:

Smartphones and other electronic devices can be great tools that offer educational value; however, the use of this technology is a privilege and must be regulated to maintain the educational integrity of the class. Cell phones, personal computers and all other electronic devices must be stored away during lectures, lessons, tests, and quizzes unless you have specific permission to use these devices during these times. Limited cell phone and electronic device use for class purposes (in the classroom) is permitted during student work time or when specifically permitted to do so. At no time are electronic devices specifically used for gaming purposes allowed in the class or the shop. Cell phone use in the shop must be limited to calculations, note taking, or accessing reference materials. The use of cell phones in the shop or classroom for social media, games, or other non-class related tasks is prohibited—this type of use causes distractions, safety hazards, accidents, and is not professional.

Classroom and Shop Rules:

- Always act in an adult manner while in the shop. This includes:
- No horseplay
- Use only machines and tools for which you have had proper training and authorization.
- Use all tools as they were designed for the job they were designed for.
- Clean up your work area as soon as you are done.
- If you see a mess, clean it up (even if you did not make the mess).
- If you use a tool, put it away when you are done (even if you found it somewhere else.
- Keep a tidy work area, cluttered work areas are dangerous, and can damage precision tools and parts.
- Do not mess with things that are not yours. Hiding someone's stuff is theft, not a joke—it is theft.
- There is zero tolerance for theft and vandalism. Suspected and confirmed instances of either will be referred to administration for documentation and can get you suspended or expelled.
- Keep your valuables secure. Sno-Isle is not responsible for your valuables.
- Never work on a part without the proper documentation (drawing and/or manufacturing order).
- Making unauthorized parts can get you suspended or expelled.
- Language must be respectful and dignified. Disrespectful, hurtful, or offensive language will not be tolerated

ATTENDANCE POLICY

Sno-Isle General Attendance Policy:

Absence for family or personal reason (including illness) needs a parent/guardian note or phone call(Attendance Line: 425-348-2222.) No note or phone call = unexcused absence

- For a **prearranged absence**, fill out the blue Pre-arranged Absence form, have it signed by a parent/guardian and the Advanced Manufacturing instructor, then submit it to the office.
- For **authorized activities** at your sending school, complete the green School-Related Activity form, have it signed at your high school and submit it to the office. It will not be counted as a Sno-Isle absence.

Advanced Manufacturing Specific Attendance Policy:

Treat this class like a job

- If your school sends a bus, you are expected to be here. If you are not here, you are absent.
- If you will be absent, YOU need to call, message, or email the instructor (BEFORE CLASS) and let them know.
- If you have prearranged the absence, you do not need to call.
- Absence with no call/not prearranged = a "zero" grade on your Employability Record for that day.

All attendance, grading, evaluations, or any part of this Syllabus may be subject to change based on current School, State or National standards/mandates set forth due to current world conditions.

Students and parents/guardians, your initials, and signatures below signify your agreement with the following statements:

Student	Parent/guardian	
_____	_____	I have read and understand the course and instructor information stated in this syllabus.
_____	_____	I understand the expectations for this class and will take responsibility to meet them.
_____	_____	I understand the professionalism standards for this class and that these standards are the majority of the evaluations given in this class.
_____	_____	I understand the attendance policy for this class and Sno-Isle. For non-prearranged absences, students must notify the instructor of their absence prior to the start of class.

I have read the syllabus for Advanced Manufacturing in its entirety and understand the policies, procedures, and expectations while attending Sno-Isle TECH. Any questions, concerns, or clarifications will be communicated to the instructor in a timely manner.

Student Name Printed _____

Student Signature _____ Date_____

Parent / Guardian Name Printed _____

Parent / Guardian Signature _____ Date_____

Mukilteo School District does not discriminate in any programs or activities on the basis of sex, race, creed, religion, color, national origin, age, veteran or military status, sexual orientation, gender expression or identity, disability, or the use of trained dog guide or service animal and provides equal access to the Boy Scouts and other designated youth groups. The following employees have been designated to handle questions and complaints of alleged discrimination: Civil Rights Coordinator and Title IX Coordinator Bruce Hobert (425-356-1319), hobertbl@mukilteo.wednet.edu, Section 504 Coordinator Lisa Pitsch (425-356-1277), pitschla@mukilteo.wednet.edu, and the ADA/Access Coordinator Karen Mooseker (425-356-1330), moosekerkw@mukilteo.wednet.edu. Address: 9401 Sharon Drive in Everett, WA. Inquiries regarding ADA/Access issues at Sno-Isle TECH Skills Center should be directed to Wes Allen, Director (425-348-2220) allenwr@mukilteo.wednet.edu. Address: 9001 Airport Road in Everett, WA 98204