

## Machine Tool Technology Lab EN-2112L

Fall 2022

Instructor: K. McClellan, O. Humphrey, P. Coleman, M. Bastoni

Office:

E-Mail:

Office Hours: Please seek out your instructor.

### Prerequisites:

None

### Awareness:

- If a cell phone is seen in class, it will be taken and given to the Undergraduate Dean.
- Students are expected to bring notebooks and writing utensils.
- Programmable calculators are not allowed during quizzes and exams.
- Cell phones may not be used as a calculator.
- Once lab starts, if a cadet leaves the lab, he/she will not be allowed back into the lab.
- All COVID-19 protocols and policies will be followed.
- You must have your mask on at all times in the lab, and it must cover your nose and mouth.

### Lab Description:

Machine tool lab meets every week. Students will be broken into groups of eight. Students will either do six weeks welding or six weeks lathe and then switch. You are required to attend ALL labs on your scheduled lab time. If you fail to make all the labs, you will fail the course. This course is very heavy on STCW requirements. Students are also required to bring the lab book each week along with required lab material (ie. Project).

### Required PPE:

All students shall be in a boiler suit, clean with no rips and with a name tag. You must have some form of ID to gain excess to the ship. Hard Hat, Eye Protection, Hearing Protection, Long sleeve boiler suit, steel-toe boots, flashlight that is working, and gloves are required.

### Attendance:

- Lab instruction classes are Mandatory. Disciplinary action will be taken if needed. An “Incomplete” grade will be issued if all labs are not completed.
- Labs meet every week. You are required to bring proper PPE to all Labs.

### Grading:

- Project 50%
- Welding 50%

### Labs:

All Engineering Labs must be attended and completed to the satisfaction of the lab instructors to receive a final grade in this course. You must show up with all your PPE.

Due to COVID-related reductions in lab space capacities and significant scheduling limitations, this creates the situation that students will not be able to make up missed in-person labs. The expectation for this course is that you will attend all labs at the scheduled time. Missed in-person labs cannot be made up nor incompletes given as a result of missed labs. If you miss a lab(s), your course grade will be impacted and may result in a failing grade; and you may be advised to withdraw from the course.

Topics:

- Safety, Lathe Introduction, Oxy/Fuel
- Brazing
- Oxy/Acetylene Cutting
- Making a High Speed Steel Cutting Tool
- Lathe Maintenance, Set-up and Practice
- Facing, Center Drilling, Layout, and Turning
- Dye Penetrant Testing
- Welding

Student Learning Outcomes:

Success in this lab will be measured through quizzes and application of your understanding of the course topics.

Learning Objectives:

- Set-up and dress the wheels on the bench grinder
- Off-hand grind a 60 degree thread form and radius thread form on a high speed steel tool blank
- Set-up and operate the lathe and tooling for facing, center drilling, turning and threading a test coupon to blueprint specifications
- Correctly align tool and test coupon and chase an existing thread
- Operate the horizontal band saw, vertical band saw, drill press, hydraulic press and hand tools
- Use precision measuring instruments
- Set up and use an oxy-fuel cutting torch
- Set-up and adjust SMAW equipment and weld a T-Joint
- Set-up and adjust oxyfuel equipment and weld a lap joint
- Identify welding defects using dye penetrant testing

STCW Learning Objectives:

- **OICEW11A** Cut a circular hole using oxyacetylene process
- **OICEW11B** Form two steel plates using brazing process
- **OICEW11C** Form two steel plates using electric arc welding process
- **OICEW11F** Visual test of welded joint
- **OICEW11G** Dye-penetrant test
- **OICEW81A** Lathe project