MASSACHUSETTS MARITIME ACADEMY

BUZZARDS BAY, MASSACHUSETTS

MARINE ENGINEERING DEPARTMENT

Machine Tool Technology

EN -2112
SPRING 16
Course Policy and Syllabus

CADET _____

CLASS SECTION_____LAB SECTION_____

DATE _____

Massachusetts Maritime Academy
Machine Tool Technology, EN-2112
SYLLABUS AND COURSE POLICY

Instructor: Lt. Mahoney
Licensed USCG Chief Engineer, Steam.
3rd Asst. Engineer, Motor
Office Hours: 11:00-13:00, Monday
11:00-12:00, Thursday

Texts:
Machine Tool Practices **(MTP)**. Authors: Kibbe, Neely, Meyer, White. Publisher, Prentice Hall; (10 TH EDITION)
How To Run A Lathe **(HTRAL)**. Publisher, South Bend Lathe
Welding Technology Fundamentals **(WTF)** Publisher, Goodheart-Willcox Inc.
Handouts

Course Composition:
Course consists of a 1 hour lecture and a 3 hour lab weekly. Labs alternate weekly between Machine Shop and Welding Lab. Course credit is 2

Learning Objectives:

- **Set-up and dress the wheels on the bench grinder.**
- **Off-hand grind a 60 degree thread form tool and radius form tool on a high speed steel tool blank.**
- **Set-up and operate the lathe and tooling for facing, centerdrilling, turning and threading a test coupon to blueprint specifications.**
- **Correctly align tool and test coupon and chase an existing thread.**
- **Operate the band saws, 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 lap joint in the flat position**
- **Set-up and adjust SMAW equipment and weld a lap joint in the vertical position**
- **Be able to identify welding defects using dye penertrant testing.**
- **Demonstrate proficiency in the following STCW elements.**
  OICEW-1-1A Cut a circular hole using oxyacetylene process
  OICEW-1-1B Form two steel plates using brazing process
  OICEW-1-1C Form two steel plates using electric arc welding process
  OICEW-1-1F Visual test of welded joint
  OICEW-1-1G Dye-penetrant test of welded joint
  OICEW-8-1A Lathe project.

Course Policy:
Attendance is **mandatory**. The students must come prepared with appropriate safety equipment, books and materials. **Students will not be admitted to class or labs after the start of the period.** Each missed class will result in a reduction of the final grade by 4 points. Maximum number of classes that can be missed for any reason is (2) More than 2 missed classes will result in a failure. Weekly quizzes will be given; quiz material will be from lectures, labs and reading assignments. **Reading assignments must be read before the due date listed on the syllabus.** All missed quizzes must be rescheduled within 24 hours. No cell phone use is allowed in class. No programmable calculators are allowed in class.

Labs:
Students must sign the muster sheet for each lab. The student must attend on their scheduled day and session. Labs run in 2 week cycles. Students must make arrangements with the instructor to make up a missed lab within 24 hours of the missed lab. The lab needs to be made up during the two week cycle,

while that lab is still being conducted. Failure to do so will result in an **incomplete.** Lab grades are determined by participation, work habits, conduct, instructor assessment, pop quiz grades, and the successful completion of projects. Each student must complete the lab projects successfully. All students will come prepared for the lab with a 3 ring binder containing the semester labs handouts and PPE.

Grading:
There will be weekly quizzes. The questions will be drawn from lectures, lab sessions, and the Marine Engineering Workbook and texts.
The final grade will be determined as follows:

Machine Shop Lab	x .20
Weekly Quizzes	x .60
Final Exam	x .20

Welding lab is pass or fail
A minimum grade of C- is required to pass this course.

Massachusetts Maritime Academy is committed to providing reasonable accommodations for students with documented disabilities. The Director of Disability Compliance works in collaboration with faculty and other campus departments to provide support for students with disabilities. This coordination of efforts complies with the mandates of Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990.

Week	Book & Topic VER 10	PAGES	Due Date Month/Day
2. Safety (lathe)	Safety (Lab 1 handout)		
	(MTP) Hazards in lathe operations)	375-377	
Safety (welding)	(WTF) Weld safety, checklist	13-19	
.			
Tooling	(MTP) Toolholders, cutting tools	386-400	3/8
OFW & Gas Cutting	(WTF) Equipment & Supplies	Chap 20	.
3. Lathe Basics	(MTP) Engine lathe	379-385	3/15
Spindle	(MTP) Spindle tooling	401-406	
Operating Controls	(MTP) Controls	407-411	
Facing, Ctr. Drilling	(MTP) Facing, ctr. drilling	413-421	
OFW & Gas Cutting	(WTF) Equipment assy. and adj	Chap 21	.
4. Turning between Centers	(MTP) Work between centers	422-434	3/29
Alignment of Centers	(MTP) Alignment of centers	435-437	
Oxyfuel Gas Cutting	(WTF) Gas cutting	Chap 22	.
5. Other Lathe Operations	(MTP) Drilling, boring etc.	438-451	4/5
Brazing and Braze Welding	(WTF) Brazing and Braze Welding	Chap 25	.
6. 60 deg. Thread	(MTP) Calculations	452-455	4/12
Cutting Ext Thrd.	(MTP) Cutting ext. UNC thrd.	457-467	
Physics Of Welding	(WTF) The physics of welding	Chap 3	
Weld Joints	(WTF) Weld joints and positions	Chap 4	.
7. Hand Tools	(MTP) Hacksaws	55-57	4/19
	(MTP) Files	58-63	
	(MTP) Hand reamers	64-67	
	(MTP) Taps	68-78	
	(MTP) Dies	79-82	
SMAW	(WTF)Equipment & Supplies	Chap 5	
SMAW	(WTF) Equipment Assy & Adj.	Chap 6	.
8. Measurement	(MTP) Steel rules (inch)	105-111	4/26
Direct Measurement	(MTP) Vernier caliper (inch)	114-117	
	(MTP) Dial caliper (inch)	120-121	
Micrometer Inst.	(MTP) Types, readings	123-138	
Vernier Mics.	(MTP) Reading vernier mics.	141-143	
Comparison Instruments	(MTP) Comparison Instruments	144-155	
SMAW	(WTF) Electrodes	Chap 7	.
	(WTF) Flat welding position	Chap 8	.
9. Lathe Tapers	(MTP) Cutting tapers	472-482	5/3
SMAW	(WTF) Horizontal, vert. & OH positions	Chap 9	.
10. Steady & Follower Rests	(MTP) Using rests	483-488	5/10
SMAW	(WTF) Surfacing	Chap 10	.
11. Sawing Machines	(MTP) Sawing machines	293-301	5/17
	(MTP) Using recip & horz machines	302-311	
	(MTP) Abrasive & Cold saws	312-314	
Vertical Band Machine	(MTP) Prep & usage	315-323	
Welding Symbols	(WTF) Welding symbols	Chap 33	.
12. Drilling Machines	(MTP) Types	331-334	
	(MTP) The drill press	335-337	5/24
Drilling tools	(MTP) Drilling tools	338-346	
	(MTP) Hand grinding	347-350	
Drilling operations	(MTP) Operating drilling machines	351-362	
Countersinking & boring	(MTP) Countersinking	363-365	.
13. Inspection & Testing Welds	(WTF) Inspection and testing welds	Chap 34	6/7

Week	Book & Topic VER 9	PAGES	Due Date Month/Day
2. Safety (lathe)	Safety (Lab 1 handout)		
	(MTP) Hazards in lathe operations)	387-390	
Safety (welding)	(WTF) Weld safety, checklist	13-19	
.			
Tooling	(MTP) Toolholders, cutting tools	399-412	3/8
OFW & Gas Cutting	(WTF) Equipment & Supplies	Chap 20	.
3. Lathe Basics	(MTP) Engine lathe	391-398	3/15
Spindle	(MTP) Spindle tooling	413-419	
Operating Controls	(MTP) Controls	420-424	
Facing, Ctr. Drilling	(MTP) Facing, ctr. drilling	425-434	
OFW & Gas Cutting	(WTF) Equipment assy. and adj	Chap 21	.
4. Turning between Centers	(MTP) Work between centers	435-447	3/29
Alignment of Centers	(MTP) Alignment of centers	448-450	
Oxyfuel Gas Cutting	(WTF) Gas cutting	Chap 22	.
5. Other Lathe Operations	(MTP) Drilling, boring etc.	451-464	4/5
Brazing and Braze Welding	(WTF) Brazing and Braze Welding	Chap 25	.
6. 60 deg. Thread	(MTP) Calculations	465-469	4/12
Cutting Ext Thrd.	(MTP) Cutting ext. UNC thrd.	470-480	
Physics Of Welding	(WTF) The physics of welding	Chap 3	
Weld Joints	(WTF) Weld joints and positions	Chap 4	.
7. Hand Tools	(MTP) Hacksaws	54-56	4/19
	(MTP) Files	57-62	
	(MTP) Hand reamers	63-66	
	(MTP) Taps	67-76	
	(MTP) Dies	77-80	
SMAW	(WTF)Equipment & Supplies	Chap 5	
SMAW	(WTF) Equipment Assy & Adj.	Chap 6	.
8. Measurement	(MTP) Steel rules (inch)	107-113	4/26
Direct Measurement	(MTP) Vernier caliper (inch)	116-119	
	(MTP) Dial caliper (inch)	122-123	
Micrometer Inst.	(MTP) Types, readings	125-139	
Vernier Mics.	(MTP) Reading vernier mics.	143-145	
Comparison Instruments	(MTP) Comparison Instruments	146-157	
SMAW	(WTF) Electrodes	Chap 7	.
	(WTF) Flat welding position	Chap 8	.
9. Lathe Tapers	(MTP) Cutting tapers	485-495	5/3
SMAW	(WTF) Horizontal, vert. & OH positions	Chap 9	.
10. Steady & Follower Rests	(MTP) Using rests	496-501	5/10
SMAW	(WTF) Surfacing	Chap 10	.
11. Sawing Machines	(MTP) Sawing machines	302-312	5/17
	(MTP) Using recip & horz machines	313-322	
	(MTP) Abrasive & Cold saws	323-325	
Vertical Band Machine	(MTP) Prep & usage	326-340	
Welding Symbols	(WTF) Welding symbols	Chap 33	.
12. Drilling Machines	(MTP) Drill machine types	341-345	
	(MTP) The drill press	346-348	5/24
Drilling tools	(MTP) Drilling tools	349-357	
	(MTP) hand grinding drills	358-361	
Drilling operations	(MTP) Operating drilling machines	362-373	
Countersinking & boring	(MTP) Countersinking	374-375	.
13. Inspection & Testing Welds	(WTF) Inspection and testing welds	Chap 34	6/7

	Monday	Tuesday	Wednesday	Thursday	Friday
	29 ORIENTATION	1 CLASS 1 LAB 1	2 LAB 1	3 LAB 1	4
MARCH	7 LAB 1	8 CLASS 2 LAB 2A LAST ADD	9 LAB 2A	10 LAB 2A	11
	14 LAB 2A	15 CLASS 3 LAB 2B	16 LAB 2B	17 LAB 2B	18
	21 LAB 2B	22 NO CLASS LAB 3A LAST DROP	23 LAB 3A	24 LAB 3A	25
	28 LAB 3A	29 CLASS 4 LAB 3B	30 LAB 3B	31 LAB 3B	
					1
APRIL	4 LAB 3B	5 CLASS 5 LAB 4A	6 LAB 4A	7 LAB 4A	8
	11 LAB 4A	12 CLASS 6 LAB 4B	13 LAB 4B	14 LAB 4B	15 HOLIDAY
	18 HOLIDAY	19 CLASS 7 LAB 5A DEFICIENCIES	20 LAB 5A	21 LAB 5A	22
	25 LAB 4B	26 CLASS 8 LAB 5B	27 LAB 5B	28 LAB 5B	29
	2 LAB 5A	3 CLASS 9 LAB 6A	4 LAB 6A	5 LAB 6A	6
MAY	9 LAB 5B	10 CLASS 10 LAB 6B LAST WITHDRW	11 LAB 6B	12 LAB 6B	13
	16 LAB 6A	17 CLASS 11 LAB 7A	18 LAB 7A	19 LAB 7A	20
	23 LAB 6B	24 CLASS 12 LAB 7B	25 LAB 7B	26 LAB 7B	27
	30 HOLIDAY	31 MON. SCHED LAB 7A			
			1	2	3
JUNE	6 LAB 7B	7 CLASS 13	8 FINALS	9 FINALS	10 *FINALS*
	13 FINALS	14 FINALS	15	16 GRADES DUE	17