



**KENNESAW STATE**  
UNIVERSITY

## SYLLABUS

SOUTHERN POLYTECHNIC COLLEGE OF ENGINEERING AND ENGINEERING TECHNOLOGY  
DEPARTMENT OF ENGINEERING TECHNOLOGY  
MET 1800: MACHINING AND CNC  
SPRING 2021

### Course Information

---

Class meeting time: Lecture Tues. 5:00pm-5:50pm  
Lab Tues./Thurs. 6:00pm-8:45pm  
Modality and Location: Lecture Online Asynchronous  
Lab Face-to-Face; Q120  
Syllabus is posted in D2L

### Instructor Information

---

Name: Randy Emert  
Email: remert@kennesaw.edu  
Office Location: Q226  
Office phone: 470-578-7406  
Office Hours: T/Th 1pm-3pm  
Preferred method of communication: email

### Course Description

---

This course is an introduction to the use and operation of selected industrial machinery, machining operations, CNC, and precision measuring instruments. Laboratory projects will emphasize safety, tooling identification, workholding setup, CNC operation, and engineering materials.

### Course Materials

---

Required Texts: ToolingU.com. Instructions and code are on D2L along with the schedule of lessons.  
Recommended Texts: Machining and CNC Technology, Michael Fitzpatrick, 4<sup>th</sup> Edition, ISBN-13: 978-1259827440  
Technology requirements: Access to internet; Solidworks; HSM Works; flash drive

### Learning Outcomes

---

Students will be able to:

1. Perform measurements on machined components using precision measurement equipment.
2. Identify and select industrial machines to perform machining operations.
3. Setup and operate various CNC and industrial machines.
4. Write basic G-Code programs for CNC machining operations.

## Course Requirements and Assignments

---

Two or three ToolingU lessons will be assigned each week. The tests at the end of the lesson will be averaged for an **Assignment** grade. Each test may be taken up to three times in order to get the best grade possible. ToolingU will be completed based on the due dates provided in the Course Schedule below.

There will be three **Test** grades. Each test will be an average of either four, five, or six weeks of ToolingU lessons based on the Course Schedule below.

There will be fourteen **Lab** grades. One lab grade will be dropped for the final average. Labs will consist of handouts, reports, and/or physical components. Each lab will be due one week after it is assigned.

## Evaluation and Grading Policies

---

Assignments	10%
Tests	40%
Labs	50%

ToolingU provides immediate feedback on each lesson with a test score. The assignment grades will be posted in D2L no later than one week after their due date. The tests will likewise be posted in D2L no later than one week after their due date. Any discrepancies on assignments, tests, or labs must be identified through email, [remert@kennesaw.edu](mailto:remert@kennesaw.edu), within one week of being posted in D2L.

### GRADING SCALE:

90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
0% - 59%	F

Grades will be rounded up if they are  $>$  or  $= .5$  or above, for example, an 89.6 is an A, but 79.2 is a C.

## Course Policies

---

Students are expected to attend each lab. If you are unable to attend, send an email to [remert@kennesaw.edu](mailto:remert@kennesaw.edu) to document that you will not be in attendance. Communication is key. If you are aware conflicts email early to notify that you will be missing class. There are fourteen labs assigned during the semester and you may drop one lab grade.

All due dates are listed in the Course Schedule below. If you are unable to meet the due dates due to extenuating circumstances, prior arrangements are required and must be documented through email at [remert@kennesaw.edu](mailto:remert@kennesaw.edu).

## Institutional Policies

---

[Federal, BOR, & KSU Course Syllabus Policies](#)

## KSU Student Resources

---

This link contains information on help and resources available to students: [KSU Student Resources for Course Syllabus](#)

## Course Schedule

Week	ToolingU Lesson	Due Date
1		1/14 11:59pm
	Overview of Machine Tools 121	
	Safety for Metal Cutting 101	
2		1/21 11:59pm
	Benchwork and Layout Operations 241	
	Basic Measurement 101	
	Basics of Tolerances 121	
3		1/28 11:59pm
	Cutting Processes 111	
	Basic Cutting Theory 201	
4		2/4 11:59pm
	Overview of Deburring Processes 251	
	Speed and Feed for the Lathe 301	
5		
	Band Saw Operation 211	2/11 11:59pm
	Introduction to Metal Cutting Fluids 221	
	Metal Cutting Fluid Safety 231	
	TEST 1 Average of all lessons above	
6		
	Engine Lathe Basics 211	2/18 11:59pm
	Engine Lathe Setup 231	
	Introduction to GD&T 200 (1994)	
7		
	Engine Lathe Operation 261	2/25 11:59pm
	Threading on the Engine Lathe 301	
	Taper Turning on the Engine Lathe 311	
8		
	Manual Mill Basics 201	3/4 11:59pm
	Manual Mill Setup 221	
9		
	Speed and Feed for the Mill 311	3/18 11:59pm
	Manual Mill Operation 251	
	Holemaking on the Manual Mill 271	
	TEST 2 Average of lessons from week 6-9	
10		3/25 11:59pm
	Haas Mill: Classic Control Panel Overview 250	
	Haas Mill Classic Controls: Entering Offsets 260	
11		4/1 11:59pm
	Haas Mill Classic Controls: Locating Program Zero 270	
	Haas Mill Classic Controls: Program Execution 280	
12		4/8 11:59pm
	Haas Mill Classic Controls: Program Storage 310	
	Haas Mill Classic Controls: First Part Runs 320	

13		4/15 11:59pm
	Haas Lathe Classic Control Panel Overview 256	
	Haas Lathe Classic Controls: Entering Offsets 265	
14		4/22 11:59pm
	Haas Lathe Classic Controls: Locating Program Zero 275	
	Haas Lathe Classic Controls: Program Execution 285	
15		4/29 11:59pm
	Haas Lathe Classic Controls: Program Storage 315	
	Haas Lathe Classic Controls: First Part Runs 325	
	FINAL Average of lessons from week 10-15	

Week	Lab Description	Due Date
1		T 1/19; Th 1/21
	Sign Safety Sheet	
	Identify Machines	
2		T 1/26; Th 1/28
	Bandsaw Horizontal/Vertical	
	Measurement (Hand File, AL)	
3		T 2/2; Th 2/4
	Belt Sander, Grinder, & Bandsaw	
	Measurement	
4		T 2/9; Th 2/11
	Lathe Setup & Operation	
	Facing & Center Drill	
5		T 2/16; Th 2/18
	Lathe Setup & Operation	
	Turning	
6		T 2/23; Th 2/25
	Lathe Setup & Operation	
	Stepped Profile	
7		T 3/2; Th 3/4
	Drilling	
	Clearance Holes	
8		T 3/16; Th 3/18
	Milling	
	Qualify a Block	
9		T 3/23; Th 3/25
	Milling	
	Qualify a Block	
10		T 3/30; Th 4/1
	Milling	
	Drilling and Tapping	
11		T 4/6; Th 4/8
	Haas Mill	
	Indicate a Vise, Change a Tool	
	Tool Offset, Work Offset	
12		T 4/13; Th 4/15
	HSM Works	
	Face, Profile, Drill Holes, Post	

13		T 4/20; Th 4/22
	Haas Mill	
	Run Programmed Part & Measure	
14		T 4/27; Th 4/29
	Haas Lathe	
	Tool Offset, Work Offset	
	HSM Works Stepped Profile	
15		T 5/4; Th 5/6
	Haas Lathe	
	Run Programmed Part & Measure	

This syllabus including scheduling and grading may be modified based on mutual agreement of instructor and student.