Precision Machining Technology   PMT 328 Live Tooling CNC Lathes
Term   Instructor:
2 Credits

Sections of the Syllabus

- **Why the online format?**
  The online format was created as part of the Advanced Machining Certificate. It was designed to allow flexibility of scheduling for students who are both full and part time and may be trying to work as well, while taking this certificate program. Lectures and programming exercises can be completed online. Actual machining projects must be completed on the CNC machines in the Precision Machining Technology lab at CMCC.
  Co-requisite PMT 326

- **Purpose and Organization:**
  This course will provide students the opportunity to learn advanced set-up and operation of CNC lathes. Students will have to complete parts using a tailstock as well as live tooling.

- **Course Objectives:**
  The purpose of this course is to provide an opportunity for students to:
  - Identify different type of live tool holders
  - Write CNC programs that utilizing live tooling for CNC lathes.
  - Utilize Mastercam generated lathe programs to produce machine parts.
  - Setup & operate CNC live tooling lathes to machine complex components.
  - Machine parts that require the use of the tailstock and live tooling.

- **Student Learning Outcomes: Required**
  At the conclusion of this course students should be able to:
  - Identify different types of tool holders utilized on live tooling lathes. (Static, live radial & axial)
  - Install and align Radial and Axial Tool holders on CNC live tooling lathes.
  - Identify and use necessary codes to manually program Live Tooling lathes
  - Successfully set-up and operate Live Tooling Lathes
  - Edit the program, if necessary, as the result of running graphics and/or trouble shooting the actual machining operation.

- **Course Topics in Sequential Order :**
  - Machine Configurations
  - Live Tooling
    - Radial & axial tool holders
    - Mount, Align, and set offsets for Live Tooling
    - Live tooling cutting capacity
    - Live tooling G & M codes
  - C-axis

- Programming codes
- C-axis feed calculation

- Y-axis

  - Travel envelope
  - Y-axis operation and programming
  - Plane selection and feed rate codes

- Drilling w/ Live Tooling
  - Canned drill cycle codes & program examples
  - Rigid tap cycles
- Fine Spindle Control

- Dual Spindle Lathes
  - Types
  - Additional Spindle
  - Programming differences
  - Part Transfers
  - Tooling Set-up

- **<u>Textbook and Required Supplies:</u>**
  - A text book is not required for this course. The student will need a flash drive and a scientific calculator with trig functions.
  - Any printed materials (*copies of power point presentations, printed handouts, etc*.) are the student's responsibility.
  - Tools, material for projects, & machining supplies will be supplied by CMCC.

- **<u>A Note About You and This Course:</u>**

  This is a hybrid class. All material needed (Lectures, Demos, Resources) will be available online. If you do not understand the information please contact the instructor via e-mail, phone, or by stopping by the lab.

  There is a schedule provided to complete the class in eight weeks. Please remember to schedule machine time accordingly. Please do not wait all semester to schedule machine time to make all of your parts, remember that there are other students in the class and availability could become limited.

  Because of the hybrid class format you also have the ability to finish the class ahead of the schedule that is outlined below.

- **<u>Contact the Instructor:</u>**
  Contact the instructor by email to xxxxx. I will respond to any email inquiries within 24 hours during the school week, Mon–Fri, and 48 hours over the weekend, Sat and Sun. I

will make every effort to post any project or test grades before the following weeks assignment is due.

- **Contact Classmates:**
There is no grade for student post for this class. Most of you will not see each other during lab time as you will all be coming in at different times to set-up and run projects. I do encourage that you use the discussion board page to talk with each other about the issues and successes you had on the projects you will be working on.

- **Course Activities:**
Students will be required to:
  - Watch each online lecture prior to doing the assigned shop project
  - Complete each assigned exercise by the completion date
  - Complete each assigned project at CMCC by the completion date
  - Complete each test by the completion date.

- **Grades:**

Letter Grade	Raw Score
A	95-100
A-	93-94
B+	91-92
B	87-90
B-	85-86
C+	83-84
C	79-82
C-	77-78
D+	75-76
D	70-74
F	0

Course Activities	Total # of Activities	Pts. per Activity	Total Pts.
Projects-	6	10 pts.	60 pts.
Tests-	2	20 pts.	40 pts.

- **Tests:**

Tests will be a cognitive written test. This will test your knowledge of the material that has been covered in Lecture assignments. They will be administered through CMConnect and will be timed. Tests will be open for the week but once the test is started the time will begin. Tests will close on the last day of the week. Students who have not taken the test before it closes will receive a 0 for the assignment.

- **Homework:**

  Homework questions will be over the Lecture assignments. These questions will be uploaded to the CmConnect webpage and can be printed off and filled out or filled out electronically. Either way I will need to receive the completed questions the week they are due. Questions not completed that week will receive a 0 for the assignment.

- **Projects:**

  There will be a total of 6 projects that will need to be made for this class. The projects are designed to evaluate your application of lectures and demos in the lab setting. They will also evaluate your ability to set-up and operate the machine tool. See attached rubric for project grade breakdown. There will be not late grade for projects not passed in on time.

  > 328-1
  > 328-2
  > 328-3
  > 328-4
  > 328-5r>