COURSE OUTLINE: MAC304 - CMPX TURN TECH

Prepared: Peter Corbett
Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	MAC304: COMPLEX TURNING TECHNOLOGY
Program Number: Name	6347: GENERAL MACHINIST L3
Department:	MECHANICAL TECHNIQUES PS
Semesters/Terms:	21F, 22W, 22F
Course Description:	This course is designed to provide Level III General Machinist Apprentices the ability to demonstrate: turning of internal or external tapers and angles using a taper turning attaching, turning of internal or external tapers and angles using a compound rest, turning of profiles, cutting ACME threads and multiple start threads, and describe sharpening of cutting tools.
Total Credits:	6
Hours/Week:	3
Total Hours:	42
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Essential Employability Skills (EES) addressed in this course:	EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication. EES 3 Execute mathematical operations accurately. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals. EES 10 Manage the use of time and other resources to complete projects.
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Other Course Evaluation & Assessment Requirements:	Other Course Evaluation Requirements: Smart watches, smart phones and similar devices are not allowed during tests or quizzes and must be removed. Grade Definition Grade Point Equivalent A+ 90 - 100% 4.00 A 80 - 89% B 70 - 79% 3.00

In response to public health requirements pertaining to the COVID19 pandemic, course delivery and assessment traditionally delivered in-class, may occur remotely either in whole or in part in the 2021-2022 academic year.

C 60 - 69% 2.00
D 50 - 59% 1.00
F (Fail)49% and below 0.00
CR (Credit) Credit for diploma requirements has been awarded.
S Satisfactory achievement in field /clinical placement or non-graded subject area.
U Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR Grade not reported to Registrar`s office.
W Student has withdrawn from the course without academic penalty.

Books and Required Resources:

Technology Of Machine Tools by Steve F. Krar, Arthur R. Gill, Peter Smid, Robert J. Gerritsen
Publisher: McGraw - Hill Edition: 8
ISBN: 9781260565782

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Describe safe working procedures when setting up and operating a lathe.	1.1 Identify potential safety hazards which may occur during lathe set-up and operating procedures. Demonstrate safe working habits including: - protective clothing - protective equipment and gear - good housekeeping - start up and shut off procedures - securing workpiece/cutting tools - stabilizing workpiece/cutting tools - lock out procedures
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Describe lathe workholding devices, attachments, and accessories. (5.5 hrs)	2.1 Describe lathe workholding devices, attachments, and accessories: - face plates - mandrel and split - steady rest - follower rest - fixture - soft jaw chucks - radius attachment - bungs and spigots - tool post grinder - tracing attachment
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Describe lathe cutting, trepanning, and forming tools, and tool holders. (6.5 hrs)	3.1 Identify tool geometry for lathe cutting tools. Describe lathe-cutting tools: - form threading tool - trepanning tools - forming tools Identify lathe cutting, trepanning, and forming tools and tool holders by determining:

		- type - shape - size - angle - cutting tool geometry - cutting capacity - function - holding characteristics - mounting characteristics - cutting characteristics - shaping characteristics - alignment - tolerances - surface finish - chip development and flow - workpiece characteristics Describe mounting, positioning, alignment, and securing procedures. Describe tool post grinding.
	Course Outcome 4	**Learning Objectives for Course Outcome 4**
	4. Develop a plan for lathe machining. (14 hrs)	4.1 Interpret drawings and/or process sheets to identify: - workpiece material - number of workpieces - form - shape of workpiece - machining operations - tolerances - surface finish - machining sequence Select lathe machining procedures: - profile turning - tool post grinding - ACME thread cutting Identify machining operations and procedures for profile turning or tool post grinding: - operating principles - rough cutting - finish cutting - surface finish - tolerances - speeds - feeds - coolant requirements - mounting of tool - positioning of tool - securing of tool - cutting capacity of lathe

	Identify measuring and checking procedures.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Perform turning. (15 hrs)	5.1 Demonstrate turning of internal and external tapers or angles using a taper turning attachment. Demonstrate turning of external and internal tapers or angles using a compound rest. Demonstrate the cutting of ACME threads. Demonstrate turning of profiles. Demonstrate sharpening of cutting tools. Demonstrate cutting of multiple start threads.
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. Perform routine maintenance. (1 hr)	6.1 Demonstrate routine maintenance and cleaning procedures. Demonstrate lubrication procedures. Demonstrate dismantling, handling, and storage of tools, tooling, workholding devices, and measuring instruments.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Attendance, Participation and Attitude	5%
Final Test and Practical Project	50%
Mid term	25%
Quiz 1	10%
Quiz 2	10%

Date: August 13, 2021

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.