



COURSE OUTLINE: MAC301 - CMPX EMGIN DRAW/CAD

Prepared: Peter Corbett

Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	MAC301: COMPLEX ENGINEERING DRAWINGS/CAD DATA
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 read and interpret geometric tolerancing and dimensioning on engineering drawings/CAD data.
Total Credits:	4
Hours/Week:	2
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 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 11 Take responsibility for ones own actions, decisions, and consequences.
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 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.

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.



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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 W Student has withdrawn from the course without academic penalty.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

Interpreting Engineering Drawings by Jensen, Helsel, Espin
 Publisher: Nelson Canada Edition: 7
 ISBN: 978-0176531515

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Identify sectional views. (2 hrs)	1.1 Identify sectional conventions.
Course Outcome 2	Learning Objectives for Course Outcome 2
2. Describe the ISO system of limits and fits as applied to features of a workpiece. (8 hrs)	2.1 Describe ISO, standard limits, and fits: - Designation - Description - Clearance - Interference - Interchangeability - nominal size - standards
Course Outcome 3	Learning Objectives for Course Outcome 3
3. Describe geometric dimensioning and tolerancing symbols and terminology. (30 hrs)	3.1 Describe geometric dimensional and tolerancing terminology: - regardless of feature size - least material condition - basic dimension - datums - feature control frame - general rules - virtual condition - symbols - individual and related features - terms - maximum material condition - flatness - straightness - circularity - cylindricity - profile of a line - profile of a surface - perpendicularity - angularity - parallelism - circular runout

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- position
- concentricity
- coplanarity
- symmetry
- datum targets
- correlative tolerance

Describe geometric form control symbols:

- flatness
- straightness
- circularity
- cylindricity

Describe geometric profile control symbols:

- profile of a line
- profile of a surface

Describe geometric orientation control symbols:

- perpendicularity
- angularity
- parallelism

Describe geometric run-out control symbols:

- circular
- total

Describe geometric location control symbols:

- position
- concentricity
- symmetry

Describe geometric control symbols:

- coplanarity
- correlative tolerance

Describe geometric datum control:

- symbol
- target point
- target area
- line

Describe the feature control frame and the order of elements.

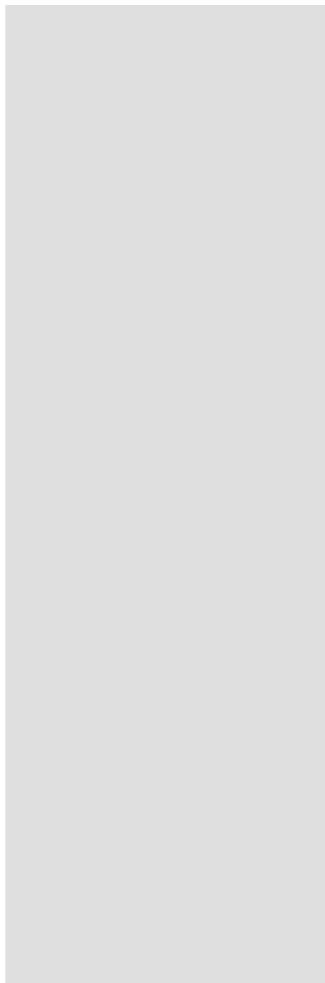
Describe the supplementary symbols:

- diameter
- radius
- reference
- counterbore/spotface
- square
- dimension origin
- projected tolerance zone
- spherical diameter
- spherical radius
- arc length

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- counter sink
- depth
- conical taper

Describe datums:

- primary
- secondary
- tertiary
- axis
- minimum location points
- datum precedence

Describe material condition symbols:

- maximum material condition (MMC)
- regardless of feature size (RFS)
- least material condition (LMC)

Describe maximum material condition, least material condition, and regardless of feature size, with reference to the size of mating parts.

Describe virtual condition and the application to gauge design:

- in relation to MMC
- in relation to LMC
- in relation to RFS
- with respect to holes
- with respect to shafts

Describe positional tolerances to hole locations:

- bonus tolerance
- basic size
- assembly of two plates with floating fasteners
- assembly with a fixed and floating fastener

Course Outcome 4	Learning Objectives for Course Outcome 4
4. Interpret geometric drawing symbols. (2 hrs)	4.1 Interpret geometric engineering drawing symbols: <ul style="list-style-type: none"> - location - datum - target

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Final Test	20%
Midterm Test	20%
Practical Assignments	30%
Theory Assignments	30%

Date: September 1, 2021

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

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