



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:	20F, 21F, 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 2020-2021 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 W Student has withdrawn from the course without academic penalty.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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	<ul style="list-style-type: none"> - counter sink - depth - conical taper <p>Describe datums:</p> <ul style="list-style-type: none"> - primary - secondary - tertiary - axis - minimum location points - datum precedence <p>Describe material condition symbols:</p> <ul style="list-style-type: none"> - maximum material condition (MMC) - regardless of feature size (RFS) - least material condition (LMC) <p>Describe maximum material condition, least material condition, and regardless of feature size, with reference to the size of mating parts.</p> <p>Describe virtual condition and the application to gauge design:</p> <ul style="list-style-type: none"> - in relation to MMC - in relation to LMC - in relation to RFS - with respect to holes - with respect to shafts <p>Describe positional tolerances to hole locations:</p> <ul style="list-style-type: none"> - bonus tolerance - basic size - assembly of two plates with floating fasteners - assembly with a fixed and floating fastener 				
	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Course Outcome 4</td> <td style="width: 50%;">Learning Objectives for Course Outcome 4</td> </tr> <tr> <td>4. Interpret geometric drawing symbols. (2 hrs)</td> <td>4.1 Interpret geometric engineering drawing symbols: <ul style="list-style-type: none"> - location - datum - target </td> </tr> </table>	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
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Evaluation Process and Grading System:

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

Date: September 3, 2020

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

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