COURSE OUTLINE: MAC201 - ENG DRAW, CAD,LAYOUT

Prepared: Kevin Sloss
Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	MAC201: ENGINEERING DRAWINGS, CAD DATA, LAYOUT
Program Number: Name	6346: GENERAL MACHINIST L2
Department:	MECHANICAL TECHNIQUES PS
Academic Year:	2022-2023
Course Description:	Upon successful completion, the apprentice will be able to describe engineering drawings graphic language and symbols, dimensional terminology, symbols, practices, orthographic projections and auxiliary views. They will develop skills to describe dimensioned workpiece tolerances, allowances, and symbols, demonstrate sketching procedures for revolved, removed, partial and broken-out sectional views. The apprentice will understand and describe the features, elements and types of gears, cams, and bearings. From understanding the information included on the drawing, the apprentice will develop an operational plan for machining parts.
Total Credits:	5
Hours/Week:	3
Total Hours:	36
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: 70%, A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
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. Describe the graphic language and symbols of engineering drawings.	1.1 Describe the types of the graphic language and symbols of engineering drawings: i. detail, assembly, sub assembly, working assemblies ii. grade numbers iii. location iv. tolerancing methods v. features symbols, surface texture vi. not to scale
	Course Outcome 2	**Learning Objectives for Course Outcome 2**
	2. Describe dimensional terminology, symbols, and practices.	2.1 Describe dimensional terms: i. break lines ii. (PCD) pitch circle diameter, (BCD) bolt circle diameter iii. across flats iv. pictorial, schematic 2.2 Describe thread representations and designations: i. thread forms ISO, metric ii. acme, square, pipe, whitworth 2.3 Describe dimensioning methods: i. point-to-point ii. datums iii. tabular iv. arrowless 2.4 Describe screw thread designations for CSA, ANSI, and ISO forms: i. nominal diameter, outside diameter (O/D) ii. turns per inch (TPI) iii. pitch and pitch diameter iv. class of fit v. external/internal vi. left/right vii. thread forms 2.5 Describe drawing elements related to workpiece processing techniques: i. welding symbols ii. draft angles iii. fillets and rounds iv. un-machined dimensioned features v. nominal dimension vi. surface texture, machined surfaces
	Course Outcome 3	**Learning Objectives for Course Outcome 3**
	3. Describe orthographic projections and auxiliary views.	3.1 Identify orthographic projections: i. first and third angle ii. ISO orthographic projection symbol 3.2 Describe auxiliary views of orthographic projection. 3.3 Describe the basic function of an auxiliary view: i. angular position ii. inclined surface iii. true shape

	iv. profile 3.4 Describe the types of auxiliary views: i. primary, secondary, sectional 3.5 Interpret engineering drawings to identify features of a finished component using first or third angle projection.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Describe tolerance, allowance, and symbols as applied to the dimensioned features of a workpiece.	4.1 Describe engineering drawing dimensional terms: i. bilateral, unilateral ii. limits iii. fits iv. allowance, clearance, interference v. interchangeability vi. nominal size vii. basic size (hole/shaft) viii. ANSI standards
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Demonstrate sketching procedures for revolved, removed, partial, and broken-out sectional views.	5.1 Sketch to scale sectional views: i. partial, revolved, removed ii. offset, aligned, broken out 5.2 Describe sectional conventions: i. spokes, ribs, lugs
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. Describe features, elements and types of gears, cams, and bearings.	6.1 Describe graphic language for gears, cams, and bearings: i. shape ii. terminology iii. symbols iv. sizes 6.2 Interpret documentation to identify gear, cam, and bearing designations: i. addendum, dedendum ii. circular pitch, diametral pitch iii. clearance iv. whole depth v. pressure angle vi. rise, follower, fall vii. anti-friction, taper, sleeve viii. dwell
Course Outcome 7	**Learning Objectives for Course Outcome 7**
7. Develop an operational plan for machining parts.	7.1 Interpret drawings to develop a plan for machining methods and procedures. 7.2 Interpret drawings to develop a plan for operational sequences.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	50%
Final Test	25%

	Midterm Test	25%

Date:	July 11, 2022
Addendum:	Please refer to the course outline addendum on the Learning Management System for further information.