COURSE OUTLINE: MAC102 - ENGINEERING DRAWINGS

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Course Code: Title	MAC102: ENGINEERING DRAWINGS/CAD DATA/LAYOUT PRO
Program Number: Name	6345: GENERAL MACHINIST
Department:	MECHANICAL TECHNIQUES PS
Academic Year:	2024-2025
Course Description:	Upon successful completion the apprentice is able to interpret engineered documentation and demonstrate sketching techniques.
Total Credits:	5
Hours/Week:	3
Total Hours:	35
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 4 Apply a systematic approach to solve problems. 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 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. EES 11 Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	Passing Grade: 70%, B 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.
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: 9th
ISBN: 9781266277474

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

Technology of Machine Tools Student Workbook by Steve F. Krar, Arthur R. Gill, Peter Smid
Publisher: McGraw Hill Edition: 9th
ISBN: 9781266321054

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
1. Identify types and formats of engineering drawings/CAD data. (1 hr)	1.1 Identify types of engineering drawings / CAD data including: - Detail - Sub-assembly - Working assembly - Assembly - ANSI, CSA, ISO, MIL standards
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Describe graphic language and symbols of engineering drawings/CAD data. (4 hrs)	2.1 Interpret the language and symbols in engineering drawings / CAD data to determine: - Shape, sizes, scales, title blocks, zoning system - Terminology, Engineering change notice (ECN), revisions, lettering on drawings - Bill of material, notes & specifications, line types, machined surfaces, surface finish 2.2 Identify drawing lines to graphically illustrate and dimension components and assemblies: - Object, hidden, leader, break, section, cutting plane, phantom, centre, extension, dimension
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Describe dimensional	3.1 Describe dimensional terms:

terminology and practices. (4 hrs)	- Overall dimensions, detail dimensions, linear, angular, circumferential - Rounds, fillets, reference dimensions, thread representations, thread standards, not-to-scale dimensions 3.2 Identify metric / inch dimensions 3.3 Describe thread representations and designations to determine: - Thread forms - Screw thread designations - Thread representations
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Describe the principle views of orthographic projection to identify component features. (6 hrs)	4.1 Describe orthographic projections: - Angle projections - ISO orthographic projection symbol 4.2 Demonstrate sketching to scale procedures using the orthographic principal views from a fully dimensioned pictorial view: - Top view - Front View - Right Side View - Cylindrical Views
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Demonstrate sketch to scale procedures for an isometric/pictorial view from a fully dimensioned orthographic drawing. (6 hrs)	5.1 Demonstrate sketch to scale proceures using third angle projection for a pictorial view from a three view orthographic drawing which includes: - 90 degree features - Angular features - Circular features
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. Demonstrate sketch to scale for sectional views. (7 hrs)	6.1 Describe elements and functions of sectional views: - Cutting plane - Exposed features - Viewing direction - Section view location - Section view position 6.2 Demonstrate sketch to scale procedures for sectional views - Full - Half
Course Outcome 7	**Learning Objectives for Course Outcome 7**
7. Develop an operational plan for machining methods and operational sequences. (7 hrs)	7.1 Interpret engineering drawings and job documentation to develop a plan for machining methods 7.2 Interpret engineering drawings to develop operational sequences
Course Outcome 8	**Learning Objectives for Course Outcome 8**

8. Describe layout procedures, techniques, and equipment. (7 hrs)	8.1 Describe layout procedures, techniques, and equipment: - Dyes / chalks, marking punches, scribing tools - Precision straight edges, steel rules, precision squares - Vernier height gauges, universal vernier bevel protractors - Radius/fillet guage sets - Contour templates - Combination sets - Workpiece holding / clamping devices 8.2 Describe layout methods and sequence of operations by determining: - Surface preparation - Layout sequences - Optimum position of workpiece - Reference and layout planes - Datum location - Accuracy and clarity of appearance - Prick punch markings, centre punch markings - Tools, instruments, accessories - Holding characteristics 8.3 Identify layout tools: - Dividers - Trammels - Hermaphrodite calipers - Prick punches & centre punches 8.4 Identify layout instruments: - Surface gauge - Combination set 8.5 Identify layout accessories: - Surface table - Angle plate, adjustable angle plate - Precision cube - Parallels - Vee-blocks - Jacks - Rule clamp, seat clamp 8.6 Describe the application of layout tools, instruments, and accessories by determining: - Workholding characteristics - Checking accuracy - Accessibility to location - Geometric construction - Point angle of tools - Checking ranges - Dimensional ranges - Scribing and marking

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight

	Assignments & Quizzes	50%
	Tests	50%
Date:	August 22, 2024	
Addendum:	Please refer to the course outline addendum on the Learning Management System for further information.	