



Lakeshore Technical College

31-420-386 GD&T Intro - CBE

Course Outcome Summary

Course Information

Alternate Title	Interpret manufacturing drawings for geometric dimension and tolerances (G D & T)
Description	...prepares the learner to interpret manufacturing drawings for geometric dimension and tolerances (G D & T).
Total Credits	1
Total Hours	32

Types of Instruction

Instruction Type	Credits/Hours
Lab	1/32

Pre/Corequisites

Corequisite 31-420-385 Orthographic Projection Print

Textbooks

Blueprint Reading for Machine Trades, **Author:** Schultz/Smith, 7th edition **ISBN:** 0132172208 **Source:** Lakeshore Technical College Bookstore. **Required**

Learner Supplies

LTC Machine Tool Operations - Print Reading Study Guide. **Source:** Blackboard Course. (required)

LTC Math & Print Course Guidelines **Source:** Blackboard Course. (required)

Scientific Calculator FX-991EX Plus -SR. **Manufacturer:** Casio. **Source:** LTC Bookstore (optional)

Six inch steel ruler. (optional)

Access to a computer with internet connectivity

Core Abilities

1. Apply learning

Criteria

- 1.1. Learner transfers academic knowledge and principles to life and work situations
- 1.2. Learner incorporates prior learning
- 1.3. Learner knows when to ask for help
- 1.4. Learner demonstrates appropriate safety precautions

- 1.5. Learner identifies the need for lifelong learning
- 1.6. Learner develops the ability to research beyond the required work
- 1.7. Learner demonstrates a curiosity for learning about cultures, norms, and practices

2. Communicate effectively

Criteria

- 2.1. Learner comprehends written materials
- 2.2. Learner writes clearly, concisely, and accurately
- 2.3. Learner adjusts communication style in order to meet the needs of others
- 2.4. Learner demonstrates active listening skills
- 2.5. Learner uses culturally appropriate verbal and non-verbal communication methods

3. Use mathematics effectively

Criteria

- 3.1. Learner solves real world problems using mathematics
- 3.2. Learner measures accurately
- 3.3. Learner analyzes graphical information
- 3.4. Learner demonstrates an understanding of world measurements and foreign currency exchange

Program Outcomes

1. Apply basic safety practices in the machine shop

Summative Assessment Strategies

- 1.1. WTCS TSA Scoring Guide

Criteria

- 1.1. Demonstrate safety procedures
- 1.2. Operate machine with all required guards in place
- 1.3. Maintain clean and organized work environment
- 1.4. Wear appropriate clothing and Personal Protective Equipment (PPE)
- 1.5. Demonstrate proper lock-out tag-out procedures

2. Interpret industrial/engineering drawings

Summative Assessment Strategies

- 2.1. WTCS TSA Scoring Guide

Criteria

- 2.1. Interpret orthographic projections
- 2.2. Interpret lines, symbols, conventions and notations
- 2.3. Distinguish between structural shapes
- 2.4. Interpret a Bill of Materials
- 2.5. Determine location of part features according to established specifications
- 2.6. Calculate tolerances according to established specifications
- 2.7. Drawings follow view projection standards
- 2.8. Interpret Geometric Dimensioning and Tolerancing

3. Apply precision measuring methods to part inspection

Summative Assessment Strategies

- 3.1. WTCS TSA Scoring Guide

Criteria

- 3.1. Select correct measuring tool for job requirements
- 3.2. Demonstrate care of precision measuring equipment according to established procedures
- 3.3. Convert English/metric measurements
- 3.4. Use standard industry measurement terminology
- 3.5. Perform precision measurement according to established procedures

Course Competencies

1. Interpret manufacturing drawings paying close attention to these details: bosses, pads, castings dimensions, tapers, limit dimensions, steel processing, and steel markings.

Linked Core Abilities

Apply learning
Communicate effectively
Use mathematics effectively

Linked Program Outcomes

Interpret industrial/engineering drawings
Apply precision measuring methods to part inspection

Assessment Strategies

- 1.1. Skillbuilder Exercise
- 1.2. Written Assignment

Criteria

Performance will be satisfactory when:

- 1.1. learner will interpret drawings for bosses, pads, slotted holes, necks and casting requirements.
- 1.2. learner submits the assignment.

Learning Objectives

- 1.a. Determine working dimensions of bosses on castings and machined parts.
- 1.b. Determine working dimensions of pads on castings and machined parts.
- 1.c. Determine taper per foot and taper per inch of tapered parts.
- 1.d. Determine large and small diameters of a tapered part.
- 1.e. Use charts to determine steel composition characteristics.
- 1.f. Determine machining information from enlarged views.

2. Interpret manufacturing drawings paying close attention to common section views.

Linked Core Abilities

Apply learning
Communicate effectively

Linked Program Outcomes

Interpret industrial/engineering drawings

Assessment Strategies

- 2.1. Skillbuilder Exercise
- 2.2. Written Assignment
- 2.3. Written Test

Criteria

Performance will meet expectations when:

- 2.1. learner will interpret section views in manufacturing drawings.
- 2.2. learner submits the assignment.
- 2.3. learner completes written test.

Learning Objectives

- 2.a. Determine cutting plane line location on drawings.
- 2.b. Determine how location of cutting plane line affects section view.
- 2.c. Identify section views on a manufacturing drawing according to their source on principle views.
- 2.d. Draw section views.

3. Interpret manufacturing prints to extract detailed information about threads and threaded fasteners.

Linked Core Abilities

Apply learning
Communicate effectively

Linked Program Outcomes

Interpret industrial/engineering drawings

Assessment Strategies

- 3.1. Skillbuilder Exercise
- 3.2. Written Assignment

Criteria

Performance will be satisfactory when:

- 3.1. learner will interpret information about threads from manufacturing drawings.
- 3.2. learner submits the assignment.

Learning Objectives

- 3.a. Recognize different methods of displaying threads on part drawings.
- 3.b. Differentiate types and forms of threads used on mechanical parts.
- 3.c. Recognize and explain the use of non-threaded fasteners.
- 3.d. Recognize and explain the use of special purpose fasteners.
- 3.e. Identify typical threaded fasteners.

4. Interpret manufacturing prints to extract detailed information about repetitive features, drawing revisions, and rockwell hardness testing.

Linked Core Abilities

Apply learning
Communicate effectively

Linked Program Outcomes

Interpret industrial/engineering drawings

Assessment Strategies

- 4.1. Skillbuilder Exercise
- 4.2. Written Assignment
- 4.3. Written Test

Criteria

Performance will be satisfactory when:

- 4.1. learner will interpret repetitive details, typical dimensions and rockwell hardness information from part drawings.
- 4.2. learner submits the assignment.
- 4.3. learner completes written test.

Learning Objectives

- 4.a. Recognize shop notes on machine drawings.
- 4.b. Explain typical machine terms used on machine drawings.

5. Interpret manufacturing prints to extract detailed information on metric drawings.

Linked Core Abilities

Apply learning
Communicate effectively

Linked Program Outcomes

Interpret industrial/engineering drawings

Assessment Strategies

- 5.1. Skillbuilder Exercise
- 5.2. Written Assignment

Criteria

Performance will be satisfactory when:

- 5.1. learner will interpret metric part drawings.
- 5.2. learner submits the assignment.

Learning Objectives

- 5.a. Identify and apply common symbols used on machine drawings.

- 5.b. Interpret metric thread table.
- 5.c. Convert inch units to metric units.
- 5.d. Convert metric units to inch units.

6. Interpret Auxiliary views found on manufacturing drawings.

Linked Core Abilities

Apply learning
Communicate effectively

Linked Program Outcomes

Interpret industrial/engineering drawings

Assessment Strategies

- 6.1. Skillbuilder Exercise
- 6.2. Written Assignment
- 6.3. Written Test

Criteria

Performance will be satisfactory when:

- 6.1. learner will interpret auxiliary views of part drawings.
- 6.2. learner submits the assignment.
- 6.3. learner completes written test.

Learning Objectives

- 6.a. Identify inclined planes on part drawings.
- 6.b. Identify oblique planes on part drawings.
- 6.c. Determine bend allowance for bending of plate.

7. Interpret manufacturing drawings for Geometric Form Dimension and Tolerances.

Linked Core Abilities

Apply learning
Communicate effectively
Use mathematics effectively

Linked Program Outcomes

Interpret industrial/engineering drawings
Apply precision measuring methods to part inspection

Assessment Strategies

- 7.1. Skillbuilder Exercise
- 7.2. Written Assignment

Criteria

Performance will meet expectations when:

- 7.1. learner will interpret drawings for geometric form control tolerances.
- 7.2. learner submits the assignment.

Learning Objectives

- 7.a. Identify and apply Geometric characteristic symbols used on machine drawings.
- 7.b. Explain condition modifiers and how tolerance is affected by feature size variation.
- 7.c. Identify Datums on machine drawings.
- 7.d. Interpret the use of Basic Dimensions on part drawings.
- 7.e. Identify and use datum reference system on part drawings.
- 7.f. Interpret geometric tolerances of orientation.