

## Lakeshore Technical College

31-420-386 GD&T Into - CBE

# Course Outcome Summary

### Course Information

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| --- | --- | --- |
|  | 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

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

Learner Supplies

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| --- |
| 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. | Interpret industrial/engineering drawings |
|  | Summative Assessment Strategies |
|  | 1.1. | in a performance demonstration |
|  | Criteria |
|  | 1.1. | Interpret orthographic projections |
|  | 1.2. | Interpret lines, symbols, conventions and notations |
|  | 1.3. | Distinguish between structural shapes |
|  | 1.4. | Interpret a Bill of Materials |
|  | 1.5. | Determine location of part features according to established specifications |
|  | 1.6. | Calculate tolerances according to established specifications |
|  | 1.7. | Drawings follow view projection standards Interpret Geometric Dimensioning and Tolerancing |
| 2. | Apply precision measuring methods to part inspection |
|  | Summative Assessment Strategies |
|  | 2.1. | in a performance demonstration |
|  | Criteria |
|  | 2.1. | Select correct measuring tool for job requirements |
|  | 2.2. | Demonstrate care of precision measuring equipment according to established procedures |
|  | 2.3. | Convert English/metric measurements |
|  | 2.4. | Use standard industry measurement terminology |
|  | 2.5. | Perform precision measurement according to established procedures |

### Course Competencies

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| --- | --- |
| 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. |