Lakeshore Technical College

31-420-385 Orthographic Projection Print - CBE

Course Outcome Summary

Course Information

Alternate Title	Interpret manufacturing orthographic projection prints
Description	…prepares the learner to interpret manufacturing orthographic projection prints.
Total Credits	1
Total Hours	32

Types of Instruction

Instruction Type	Credits/Hours
Lab	1/32

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 Casio FX-991EX . **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.   **Apply sustainable practices**

   Criteria

2.1.   Learner demonstrates awareness of the ecological impact related to his/her chosen area of study
2.2.   Learner identifies environmental conservation strategies
2.3.   Learner can identify how sustainable practices produce a lean work environment
2.4.   Learner incorporates sustainable practices (environmental, economic, social, and cultural) during the decision making process

3.   Communicate effectively

Criteria
3.1.   Learner comprehends written materials
3.2.   Learner writes clearly, concisely, and accurately
3.3.   Learner adjusts communication style in order to meet the needs of others
3.4.   Learner demonstrates active listening skills
3.5.   Learner uses culturally appropriate verbal and non-verbal communication methods

4.   Demonstrate critical thinking

Criteria
4.1.   Learner determines issues that merit action
4.2.   Learner takes initiative in the problem solving processes
4.3.   Learner makes decisions considering alternatives and consequences
4.4.   Learner refines action plans based on evaluation of feedback
4.5.   Learner identifies interdependencies of world issues & events

5.   Demonstrate responsible and professional workplace behaviors

Criteria
5.1.   Learner displays behavior consistent with the ethical standards within a discipline or profession
5.2.   Learner follows policies and procedures
5.3.   Learner attends class as mandated by the instructor
5.4.   Learner completes assignments on time
5.5.   Learner exhibits academic honesty
5.6.   Learner accepts responsibility and accountability for his/her actions
5.7.   Learner demonstrates time management and task prioritization
5.8.   Learner demonstrates ability to handle ambiguity and unfamiliar situations

6.   Use mathematics effectively

Criteria
6.1.   Learner solves real world problems using mathematics
6.2.   Learner measures accurately
6.3.   Learner analyzes graphical information
6.4.   Learner demonstrates an understanding of world measurements and foreign currency exchange

7.   Work cooperatively

Criteria
7.1.   Learner contributes to a group with ideas, suggestions, and effort
7.2.   Learner completes his/her share of tasks necessary to complete a project
7.3.   Learner encourages team members by listening and responding appropriately to their contributions
7.4.   Learner maintains self control
7.5.   Learner resolves differences for the benefit of the team
7.6.   Learner accepts constructive feedback
7.7.   Learner effectively establishes rapport and builds situationally appropriate relationships

Program Outcomes

1.   Interpret industrial/engineering drawings

Summative Assessment Strategies
1.1.   WTCS TSA Scoring Guide

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
1.8.	Interpret Geometric Dimensioning and Tolerancing

Course Competencies

1. Interpret terminology commonly used in the machine trades.

Linked Core Abilities
Apply learning
Communicate effectively
Demonstrate critical thinking
Demonstrate responsible and professional workplace behaviors
Work cooperatively

Linked Program Outcomes
Interpret industrial/engineering drawings

Assessment Strategies
1.1.   Skillbuilder Exercise
1.2.   Written Assignment

Criteria

Performance will meet expectations when:

1.1.   learner submits the assignment.
1.2.   you can interpret commonly used terminology .

Learning Objectives
1.a.   Define common abbreviations used on manufacturing drawings.
1.b.   Define common terms used in metal manufacturing.

2. Interpret manufacturing drawings, paying close attention to common line types.

Linked Core Abilities
Apply learning
Communicate effectively
Demonstrate critical thinking
Demonstrate responsible and professional workplace behaviors
Work cooperatively

Linked Program Outcomes
Interpret industrial/engineering drawings

Assessment Strategies
2.1.   Skillbuilder Exercise
2.2.   Written Assignment

Criteria

Performance will meet expectations when:

2.1.   learner submits the assignment.
2.2.   you can identify common line types on manufacturing drawings.

Learning Objectives
2.a.   Explain what each type of line represents and how it is used.
2.b.   Identify in a drawing common line types used in manufacturing drawings.

3. Interpret manufacturing drawings, paying close attention to dimensional systems, title block information and drawing notes.

Linked Core Abilities
Apply learning
Communicate effectively
Demonstrate critical thinking
Demonstrate responsible and professional workplace behaviors
Use mathematics effectively
Work cooperatively

Linked Program Outcomes
Interpret industrial/engineering drawings

Assessment Strategies
3.1.   Skillbuilder Exercise
3.2.   Written Assignment
3.3.   Written Test

Criteria

Performance will meet expectations when:

3.1.   learner submits the assignment.
3.2.   learner applies the information in the title block to the part print drawing.
3.3.   learner completes written test.

Learning Objectives
3.a.   Recognize different dimension arrangements used on working drawings.
3.b.   Explain the different types of title block information.
3.c.   Explain what a tolerance is and define its importance.
3.d.   Explain how tolerances can be displayed on drawings.
3.e.   Recognize factors that affect tolerances.

4.   Apply sketching techniques to the development of both isometric and orthographic drawings.

Linked Core Abilities
Apply learning
Communicate effectively
Demonstrate critical thinking
Demonstrate responsible and professional workplace behaviors
Use mathematics effectively
Work cooperatively

Linked Program Outcomes
Interpret industrial/engineering drawings

Assessment Strategies
4.1.   Skillbuilder Exercise
4.2.   Written Assignment

Criteria

Performance will meet expectations when:

4.1.   learner sketches an orthographic drawing from an isometric pictorial.
4.2.   learner sketches an isometric pictorial from a orthographic drawing.
4.3.   learner completes written assignment.

Learning Objectives
4.a.   Explain the relationships among surfaces, lines and points.
4.b.   Explain the importance of the relative positions of views on an industrial print.
4.c.   Recognize the viewings angles for the front, top and side views.
4.d.   Recognize differences between isometric perspective and oblique perspective drawings.
4.e.   List the factors that determine which view is selected as the front view.
4.f.   Create orthographic flat view drawings from isometric perspective drawings.
4.g.   Create isometric perspective drawings from orthographic flat view drawings.

5.   Interpret multi-view drawings for the purpose of determining missing dimensions, using

standard and specific tolerances.

Linked Core Abilities
Apply learning
Communicate effectively
Demonstrate critical thinking
Demonstrate responsible and professional workplace behaviors
Use mathematics effectively
Work cooperatively

Linked Program Outcomes
Interpret industrial/engineering drawings

Assessment Strategies
5.1.   Skillbuilder Exercise
5.2.   Written Assignment
5.3.   Written Test

Criteria

Performance will meet expectations when:

5.1.   learner will interpret multi-view drawings for specific dimensions.
5.2.   learner submits the assignment.
5.3.   learner completes written test.

Learning Objectives
5.a.   Recognize and apply concepts of chain dimensioning.
5.b.   Recognize and apply concepts of absolute dimensioning.
5.c.   Translate feature dimensions from view to view.

6. **Interpret manufacturing drawings that use foreshortened views, and determine missing angular dimensions.**

Linked Core Abilities
Apply learning
Communicate effectively
Demonstrate critical thinking
Demonstrate responsible and professional workplace behaviors
Use mathematics effectively
Work cooperatively

Linked Program Outcomes
Interpret industrial/engineering drawings

Assessment Strategies
6.1.   Skillbuilder Exercise
6.2.   Written Assignment

Criteria

Performance will meet expectations when:

6.1.   learner will interpret multi-view drawings with foreshortened views and inclined planes.
6.2.   learner submits the assignment.

Learning Objectives
6.a.   Determine included angle dimensions.
6.b.   Determine angle of centerline dimensions.
6.c.   Determine lengths of slots and grooves.

7. **Interpret manufacturing drawings paying close attention to reference dimensions, keyseats, keyways, counterbores, countersinks, and surface finish characteristics.**

Linked Core Abilities
Apply learning
Communicate effectively

Demonstrate critical thinking
Demonstrate responsible and professional workplace behaviors
Use mathematics effectively
Work cooperatively

Linked Program Outcomes
Interpret industrial/engineering drawings

Assessment Strategies
7.1.   Skillbuilder Exercise
7.2.   Written Assignment
7.3.   Written Test

Criteria

Performance will meet expectations when:

7.1.   learners will interpret surface finish information.
7.2.   learner applies the information on a part print drawing with respect to holes, chamfers and keyways.
7.3.   learner submits the assignment.
7.4.   learner completes written test.

Learning Objectives
7.a.   Determine reference dimensions.
7.b.   Determine working dimensions of keyseats and keyways.
7.c.   Recognize symbols that are used to describe surface finish.
7.d.   Interpret surface finish symbols used on a drawing.
7.e.   Describe methods of checking surface finish.

8.   **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
Demonstrate critical thinking
Demonstrate responsible and professional workplace behaviors
Use mathematics effectively
Work cooperatively

Linked Program Outcomes
Interpret industrial/engineering drawings

Assessment Strategies
8.1.   Skillbuilder Exercise
8.2.   Written Assignment

Criteria

Performance will meet expectations when:

8.1.   learner will interpret drawings for bosses, pads, slotted holes, necks and casting requirements.
8.2.   learner submits the assignment.

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