



## COURSE OUTLINE: MTF101 - BLUEPRINT READING

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Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	MTF101: APPLIED BLUEPRINT READING
<b>Program Number: Name</b>	4051: METAL FABRICATION 4053: WELDING TECHNIQUES
<b>Department:</b>	IRONWKR APPR./WELDING RELATED
<b>Semesters/Terms:</b>	21F
<b>Course Description:</b>	Perform drawings, common views, and basic drafting and sketching operations as applied to the welder/fabricator programs.
<b>Total Credits:</b>	3
<b>Hours/Week:</b>	3
<b>Total Hours:</b>	45
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>This course is a pre-requisite for:</b>	MTF130, MTF140
<b>Vocational Learning Outcomes (VLO's) addressed in this course:</b>	<p><b>4051 - METAL FABRICATION</b></p> <p>VLO 1 Interpret blueprints and produce basic drawings and bills of materials.</p> <p>VLO 7 Complete all work in compliance with health and safety legislation and prescribed organizational practices and procedures to ensure safety of self and others.</p> <p><b>4053 - WELDING TECHNIQUES</b></p> <p>VLO 1 Perform work responsibly and in compliance with the Occupational Health and Safety Act.</p> <p>VLO 2 Interpret engineering drawings and blueprints and produce basic graphics as required by industry.</p> <p>VLO 3 Recognize and understand use of welding symbols.</p> <p>VLO 4 Use layout and fabrication processes typical to the industry to determine correct form with accuracy.</p> <p>VLO 5 Select appropriate tools and devices to perform mathematical calculations and technical measurements for successful completion of a project.</p>
<b>Essential Employability Skills (EES) addressed in this course:</b>	<p>EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>EES 3 Execute mathematical operations accurately.</p> <p>EES 4 Apply a systematic approach to solve problems.</p> <p>EES 6 Locate, select, organize, and document information using appropriate technology</p>

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and information systems.

- 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: 50%, D

A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.

**Other Course Evaluation & Assessment Requirements:**

- 1.Late hand in penalties will be -10% per day.
- 2.If a student misses a test, he/she must have a valid reason (i.e. medical or family emergency documentation shall be required). In addition, the instructor MUST be notified PRIOR to the test sitting. If this procedure is not followed the student will receive a mark of zero on the test with no make-up option.
- 3.Re-writes are NOT allowed for any written assignment, quiz or test.
- 4.Course attendance is mandatory. Any student that is not present for the first 3 classes in each course, will be deemed to have not completed the required safety orientation for the course and will not be permitted to continue. One percent (1 %) per hour will be deducted from the final course grade for unexcused\* absence. Any unexcused attendance beyond 15% of the total allocated course hours will result in the student receiving a failing grade for the course.

Valid reasons would include:

Doctors note

Family Death or Serious Illness supported by a written note.

Unexcused absence\* will be determined in a case by case basis by the instructor of each course.

**Books and Required Resources:**

IPT's Metal Trades & Welding  
Publisher: IPT Publishing & Training Ltd.

Kit: ILM Post-Secondary Package by Alberta Government  
Publisher: AK Graphics, Sault College Print Shop

**Course Outcomes and Learning Objectives:**

Course Outcome 1	Learning Objectives for Course Outcome 1
Perform drawings, common views and basic drafting and sketching operations as applied to the welder/fabricator programs	Upon successful completion of this course, the student will demonstrate the ability to:  1. Basic Lines and Views 1. Identify and describe the usage for the common line types which are:

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and explain the features of joint types, positions and welding symbols as applied to welder/fabricator programs.

Object Line  
Hidden Line  
Center Line  
Extension Line  
Dimension Line  
Leader Line  
Cutting Plane Line  
Section Line  
Chain Line  
Short Break Line  
Long Break Line  
Phantom Line

2. Identify two different methods in which an object is represented on a print.
3. Identify the proper orientation of the views used in an orthographic projection.
4. List the different views used in an orthographic projection.

#### 2. Sketching

1. Discuss the purpose of sketching and its importance.

2. Sketch a straight line.
3. Sketch Arcs and Circles.

Create an arc using two different methods

Create a circle using the right angle method

Create a circle using the square method

Create a circle using the triangle method

4. Create an orthographic sketch.

5. Create an oblique sketch.

6. Create an isometric sketch.

7. Create an isometric circle.

Use the angle method to create an isometric circle

Use the triangle method to create an isometric circle

Use the rectangle method to create an isometric circle

#### 3. Notes and Specifications

1. Identify the standard paper sizes used in mechanical drawing.

2. Identify the typical information contained within a drawing title block.

3. Describe the difference between general notes and local notes.

4. Identify the proper location for a specification.

#### 4. Dimensions

1. Define the following terms:

Common Fraction

Inclined Angle

Lead

Feather Edge

Dual Dimensioning

Base Size

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Actual Size  
Nominal Size

2. Identify the following types of dimensions:

Angular Dimensions

Linear Dimensions

Radius and Arc Dimensions

Drilled Hole Dimensions

Countersunk and Counterbored Holes Dimensions

Spotface Dimensions

3. Discuss the importance of tolerances.

4. Identify the following elements of a tolerance:

Minimum

Maximum

5. Understand the importance of a drawings scale.

6. Understand the following dimensioning methods:

Conventional Dimensioning

Baseline Dimensioning

5. Bill of Materials

1. Discuss the importance of a bill of materials.

2. Identify the size and quantity of a particular part by looking at a bill of materials.

3. Specify a particular type of steel used in a bill of material.

4. Identify a project summary worksheet and describe its purpose.

5. Define the following terms:

Sheet Metal

Metal Plate

Flat Bar

Long

Flat

6. Structural Shapes

1. Define the following terms:

Hot-Rolled

Cold-Rolled

Weight

S-beams

I-Beams

2. Identify many of the common structural shapers used.

Square Bar

Rectangular Bar

Sheet

Strip or Band

Plate or Flat Bar

Round Bar

Half Oval Bar

Hexagon Bar

Octagon Bar

Angle

Equal Legs

Unequal Legs

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Tee  
 Channel  
 Zee  
 Standard S-Beam  
 Wide Flange Beam  
 Square and Rectangular Tubing  
 Pipe  
 Standard  
 Extra Strong  
 Double Strong  
 Round Tubing  
 Standard  
 Thin wall  
 3. Specify pipe size by using schedule numbers.  
 4. Identify the common schedule number used for pipe sizes.

7. Other Views  
 1. Define the following terms:  
 Break Symbol  
 Revolved Section  
 Auxiliary Views  
 Enlarged Detail  
 Developed View  
 Revolved View  
 Untrue Projection

2. Identify an auxiliary view and describe when they are typically used.  
 3. Determine when it is necessary to use both a Right` ..... and Left` ..... side to describe the detail associated with a part.  
 4. Determine when it is necessary to locate a side view in an alternate position from the norm.  
 5. Determine the proper location for an enlarged view.  
 6. Discuss the purpose of a development (developed view).  
 7. Determine when it is necessary to use a revolved view.

8. Sections  
 1. Define the following terms:  
 Cutting Plane  
 Section  
 2. Identify the following sections:  
 Full Section  
 Half Section  
 Revolved Section  
 Assembly Section  
 Phantom Section  
 Aligned Section  
 Break-Out Section  
 Offset Section  
 Removed Section  
 3. Determine when the following sections are to be used

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Full Section  
 Half Section  
 Revolved Section  
 Assembly Section  
 Phantom Section  
 Aligned Section  
 Break-Out Section  
 Offset Section  
 Removed Section  
 9. Detail, Assembly, and Subassembly Prints  
 1. Define the following terms:  
 Detail Drawing  
 Assembly Print  
 Subassembly Print  
 2. List the components that makeup a detail drawing.  
 3. List the components that makeup an assembly print.

10. Welding Symbols and Abbreviations  
 1. Define the following terms:  
 Reference Line  
 Arrow  
 Tail  
 Arrow Side  
 Other Side  
 2. List the components that makeup a standard welding symbol.  
 3. Identify the proper location of a weld symbol.  
 4. Identify additional welding symbols elements.  
 5. Identify field weld and weld-all-around symbols.  
 6. Identify supplementary contour and finish symbols.  
 7. Identify multiple weld symbol information.  
 8. Identify bevel information.  
 9. Understand multiple reference lines.  
 10. Understand welding abbreviations.

**Evaluation Process and Grading System:**

Evaluation Type	Evaluation Weight
Drawing Assignments	80%
Tests	20%

**Date:**

September 17, 2021

**Addendum:**

Please refer to the course outline addendum on the Learning Management System for further information.

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