



Skill Set

# Industrial Mechanic

POST-SECONDARY

## 1 INTRODUCTION

Competition skill set for Industrial Mechanic Skill 01

## 2 DESCRIPTION OF COMPETITION SKILL SET

The following is a list of skills that competitors should be familiar with before participating in SCNC 2026.

### 2.1 Total competition time: 12hrs

Competition time breakdown:

Project	Time
A. Welding and fabrication	3h
B. Power Transmission and industry equipment	3h
C. Fluid Power	3h
D. Shaft alignment and predictive maintenance	3h

### 2.2 Competition Notes

- Detail and assembly drawings will be provided
- Drawings will be dimensioned using the imperial and/or metric systems.
- Measuring will be performed in the imperial and metric systems.
- Safe working procedures and practices must always be demonstrated during the competition.

## 3 A: Welding and Fabrication

The following is a breakdown of the required skills for the fabrication project.

### 3.1 The project will be fabricated from mild steel requiring:

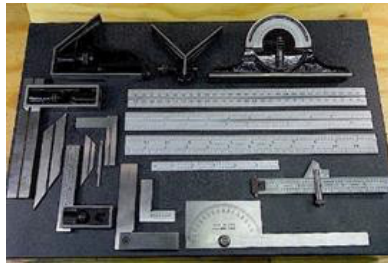
- Precision layout
- Metal cutting
- MIG welding
- Drilling and hole tapping



### 3.1.1 Precision Layout

Precision hand layout using combination squares, scribes, hammers, punches, and various hand tools.

- Tolerances:  $\pm 1/16"$  (0.0625")



### 3.1.2 Metal Cutting

Measure and use a Dewalt metal chop saw to cut mild steel square tubing with a wall thickness of 0.188"



### 3.1.3 MIG Welding

Tack and weld mild steel square tubing and 3/8" thickness mild steel plate using Lincoln Electric Power mig 215 MP welder and 0.030" diameter MIG welding wire as per assembly drawings and basic welding symbols.



### 3.1.4 Drilling and hole tapping

Drill holes in mild steel using vertical drill press, a Dewalt magnetic drill, and/or a Dewalt cordless drill. Perform hand tapping of holes as needed.



## 4 B. Power Transmission and Industry Equipment

The project will include the installation, troubleshooting, and maintenance of industrial equipment such as:

- Pumps: End-suction centrifugal process pump



- Bearings: SKF bearing installation procedure
  - Straight bore bearings
  - Tapered shaft bearings
  - Tapered adapter sleeve bearings
  - Withdrawal sleeve bearings

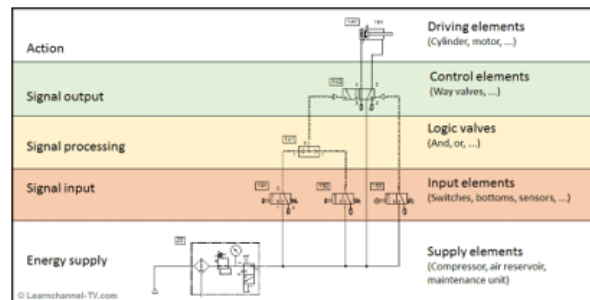


## 5 C. Fluid Power

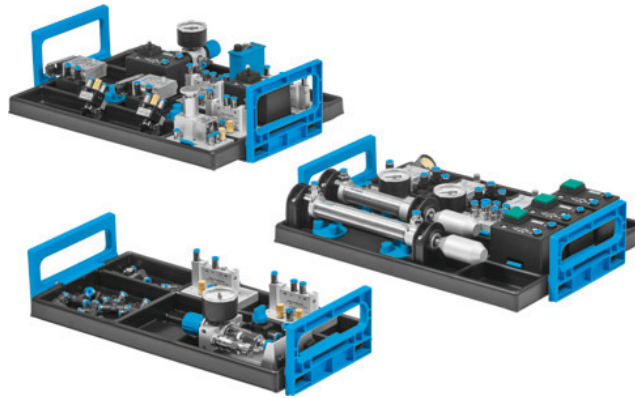
The following is a breakdown of the required skills for fluid power breakdown.

- ISO fluid power symbols
- Design pneumatic circuits
- Build pneumatic circuit
- Modify pneumatic circuit
- Troubleshooting
- Stainless steel tube bending

### 5.1 Design and draw a pneumatic circuit schematic according to the supplied instructions, using the provided template with ISO-standard pneumatic symbols



- 5.2** Build a pneumatic circuit according to the supplied instructions, using Festo Didactic components.



- 5.3** Modify or troubleshoot pneumatic circuit according to the supplied instructions, using Festo Didactic components.

- 5.4** Use Swagelok tube benders, cutters, and connectors to perform the necessary bending connections with 1/4" diameter stainless steel tubing, following the provided drawings and instructions.



## 6 E. Shaft Alignment and Predictive Maintenance

The following is a breakdown of the required skills for the alignment and predictive maintenance project.

- Rough shaft alignment
- Dial alignment
- Laser shaft alignment
- Vibration measurement
- Balancing

Fixturlaser NXA precision laser shaft alignment information available at:  
<https://stcd.ca/solutions/shaft-alignment/nxa-pro/>



### 6.1 Using the Fixturlaser SMC, perform a vibration measurement and record the data.

Fixturlaser SMC information available at: <https://stcd.ca/solutions/condition-monitoring/smc/>

### 6.2 Using the Fixturlaser SMC-Balancer, perform a single-plane balancing to rectify vibration using calibrated weights.

Fixturlaser SMC information available at: <https://stcd.ca/solutions/condition-monitoring/smc/>





READING



NUMERACY



PROBLEM SOLVING