



Skill Sets

# Industrial Mechanics

POST-SECONDARY

## 1 INTRODUCTION

Industrial Mechanics Skill # 1 Skill Set Information

## 2 DESCRIPTION OF SKILL SETS

Listed below are the skill sets competitors should be familiar with prior to SCNC Quebec 2024

- Total Competition time: 14hrs

Predictive Maintenance	}	= 25marks
Laser Shaft Alignment		
Fabrication & Welding	}	= 25 marks
Precision Hand Layout		
Stainless Steel Tube Bending		
Pump Disassembly/Inspection/Reassembly/Commission		= 25 marks
Pneumatics (Design/Build/Commission/Troubleshoot)		= 25 marks
<b>Total Marks:</b>		<b>= 100</b>

- Detail and Assembly Drawings will be 3<sup>rd</sup> Angle Projection. (1<sup>st</sup> or 3<sup>rd</sup> Angle Projection International)
- Drawings will be dimensioned using the imperial and metric systems.
- Safe Working Procedures/Practices must always be demonstrated during the competition.

**Module # 1:**

**Predictive Maintenance and Laser Shaft Alignment.**

- With the supplied diagnostic equipment record and analyze the machine vibration signature.
- Using standard procedures and protocols rectify the vibration (single plane balancing) and alignment issues using calibrated weights, shims, diagnostic equipment, and tooling.

Record the following:

- The exact conditions found (before)
- What actions were performed (with documentation)
- The condition at completion

**Equipment:**

- SMC-Balancer <http://www.fixturlaser.com/Shaft-Alignment/Fixturlaser-SMC/>
- AT 300 <http://www.fixturlaser.com/Shaft-Alignment/Fixturlaser-NXA/FIXTURLASER-NXA-Pro/>



**Module # 2**

**Fabrication; Welding; Precision Layout and Tube Bending.**

- **Fabrication:** Assembly of components.  
Tolerances +/- 1/16" (.0625") (1.5mm)



- **MIG Welding:** Mild steel box section, square or rectangular. Wall thickness 1/8" (.125") (3mm)

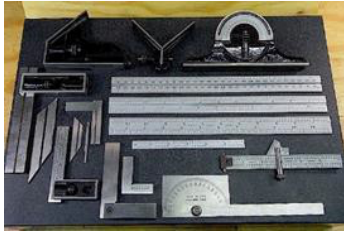


- **Welding Equipment:**
- Lincoln Electric MIG Welder
- (.035" (0.9mm) diameter MIG welding wire)



- **Precision Hand Layout/Work and Hand Tools:** Combination squares, scribes, center punches, hammers, drilling, tapping, hand tools; files, hand drills, etc.

Tolerances +/- 1/64" (.015") (0.40mm)



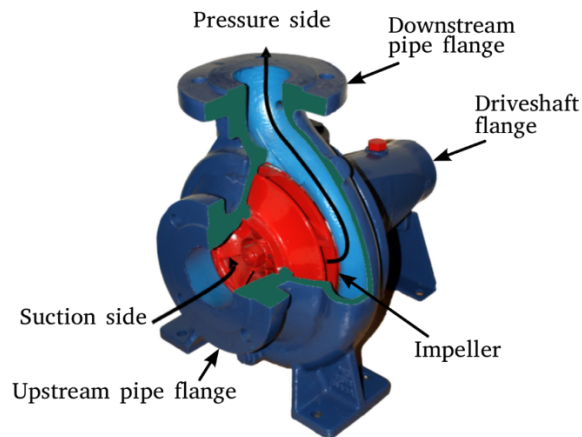
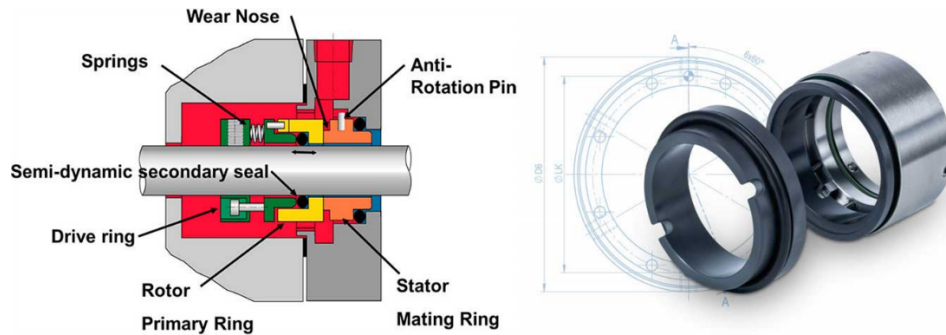
- **Stainless Steel Tube Bending:** Calculations and allowances, preparation for bending, reverse bending, bending to angles ranging from: 15° to 180°, perform required tube bending operations to the specifications and tolerances, stainless steel tubing will be

¼" diameter. Tolerances +/- 1/16" (.0625") (1.5mm)



**Module # 3:**

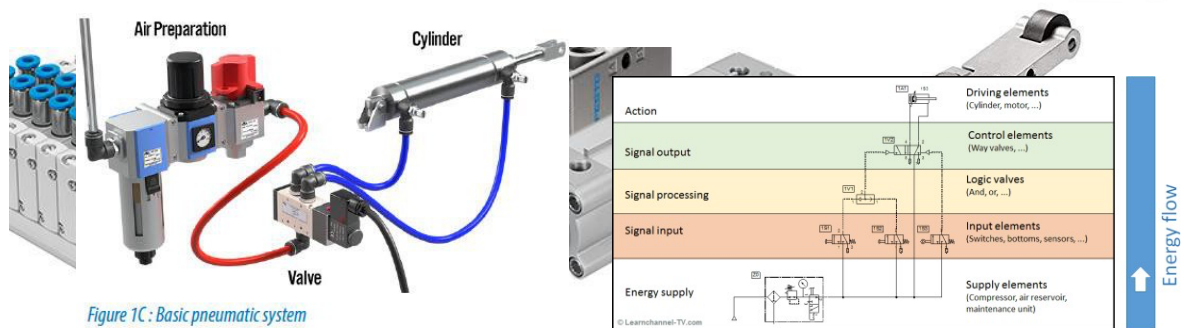
- **Disassembly, inspection, reassembly and recommissioning of supplied centrifugal pump with mechanical seals.**

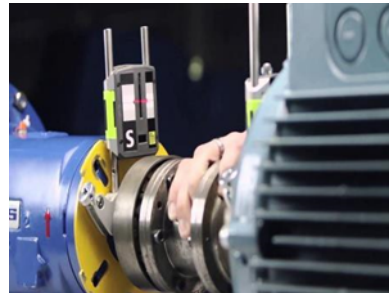


**Module # 4:**

**Fluid Power – Pneumatics – Build and Test.**

- Design, build, test and troubleshoot the function of a multi cylinder Pneumatic Sequential **“OR”** Cascade circuit as per the supplied sequence, Festo components and accessories.





**Additional Training on SMC for Predictive Maintenance Project:**

Fixturlaser (Nathalie Drouin) has kindly agreed to do training via “Skype” for competitors and trainers closer to the competition next year. Time and date to be announced.



READING



NUMERACY



PROBLEM SOLVING