

# ENGR480 Manufacturing Systems

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MWF 11:00 CSP165

Lab Tues 2-5PM KRH105

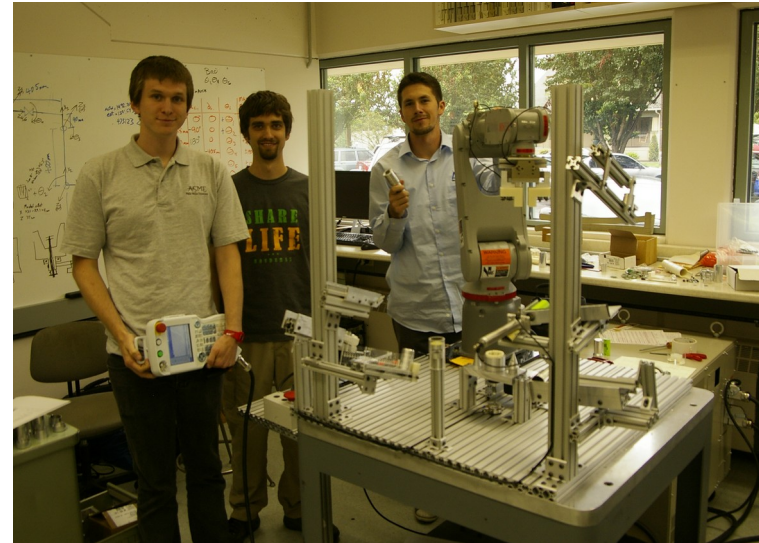
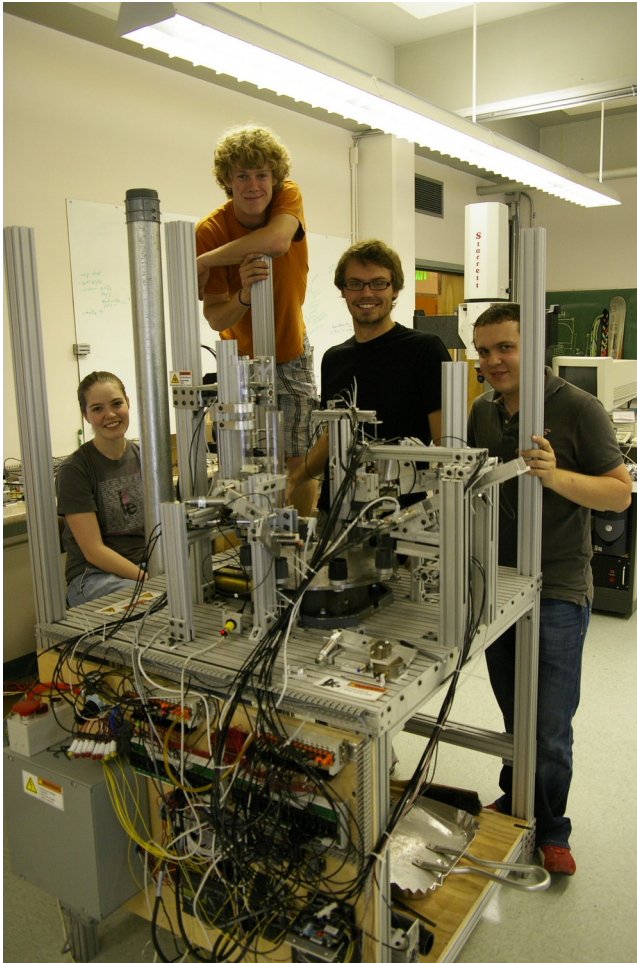
Schedule and Information at

<https://enr.wallawalla.edu/enr480>

Assignments and dropboxes at D2L

# Factory Automation

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# Past Projects

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Wooden puzzles

Brushless motor stators

Flashlights

Yoyos

Blending plastic pellets

Winding filament on  
spools

Intellipaper testing

Cell phone cases

Headlamps

Glass/steel nozzles

Mosaics

Syringe swapping

Mandrel / Glass tube  
assembly

Glass vial fill & finish

# Automation Project

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## Rejuvenating Dry Erase Markers



# Refilling

<http://sds.staples.com/msds/805690.pdf>

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.2 Mixtures

#### Hazardous components

Component		Classification	Concentration
<b>Ethanol</b>			
CAS-No.	64-17-5	Flam. Liq. 2; H225	50 - 70 %
EC-No.	200-578-6		
Index-No.	603-002-00-5		
<b>2-Propanol</b>			
CAS-No.	67-63-0	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319, H336	10 - 20 %
EC-No.	200-661-7		
Index-No.	603-117-00-0		

For the full text of the H-Statements mentioned in this Section, see Section 16.

<https://www.officedepot.com/pdf/msds/259251.pdf>

<b>Section Three:</b>	<b>Composition</b>
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Alcohol Blend (may contain (64-17-5), (67-63-0), (71-36-3), (123-42-2)), pigments, polymers, additives, scent

# Solvents

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- Isopropyl Alcohol (2-Propanol)
- Ethyl Alcohol (Ethanol)
- Acetone



# Safety

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Hazard statement(s)	
H225	Highly flammable liquid and vapor.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
Precautionary statement(s)	
P210	Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal

# First Assignment

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1. Look for email from Catme.org, follow link, and take Team Making survey
2. From a campus computer or vpn, go to:  
<https://elock.cs.wallawalla.edu> and set up your account so I can give you access to KRH105
3. Do internet research on refilling dry erase markers.