Name:	Grading Quarter:	Week Beginning: 08
Robert Lefrandt	2	12/04/2023
School Year: 2023-24	Subject: Robotics	

Monday

Notes:

12/04/2023 Check for VEX Game Elements arrival/Register

Robotic Assemblies Mechtronics

Engineering: ReEngineering Reverse Engineering

Structural Chassis frame body

Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed

Electrical Chemical electrochemical

Physical Magnetism Batteries

Software Block PLC ladder logic, CNC, Python, C++,

Sensors
Bump/touchDis
tance
Light
Camera

Physical Computing

Al Data Collect DataAnalyze

Collaborate with schools, 'Industry Professional Community

***Hold Robotics Team/Club Meeting this week to discuss:

- **Review for Test/Az CTE Assessment Blocks (1,4) Dec. 18-19, 2023
- *Register Teams VRC Competition 1/6/24 @ Whiteriver, Alchesay High School
- *Diamond Back Robotics Competition Spring/Summer
- *PO/Paid/Check Registration VEX V5 Team(s)/VEX Prof+ Access
- Discuss Robotics 11/17-18/23 Competition @ Whiteriver, Chief Alchesay Center
- Battlebot Competition with Show Low High School
- Download Libraries for Thonny IDE on workstations (laptops?) for Pico W Kit
- SunFounder Raspberry Pi Pico W Ultimate Starter Kit with Online Tutorials, 450+ Items, 117 Projects, MicroPython, Piper Make and C/C++ (Compatible with Arduino IDE)

Objective:

Apply basic engineering principles and technical skills for... artificial intelligent management ...[automation]...the principles of robotics, design, operational testing, system maintenance, repair procedures, robot computer systems, and control languages.

(AZ CTE Automation & Robotics-Program Description)

- PERFORM ELECTRICAL AND ELECTRONIC TASKS
- ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS
- PERFORM DRAFTING TASKS-Make dimensional CAD drawings (e.g., 2D and 3D)
- DESCRIBE THE OPERATION AND USE OF VARIOUS FORMS OR ELECTRICAL MOTORS
- Explain the operation and use of DC motors in automation controls
- PERFORM MECHANICAL SYSTEMS LINKAGES TASKS
- APPLY SENSOR SOLUTIONS
- DEMONSTRATE SAFE AND PROPER USE OF ELECTRONIC AND OTHER LABORATORY EQUIPMENT, TOOLS, AND MATERIALS

Lesson Overview:

1st Semester Students:

- Login to VEX Certification Accounts:
- VEX V5, Block, Python Programming, Workcell
- Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++

Sensors

- Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis
 2nd Semester Plus+ Students:
- Login to VEX Certification Accounts:
- VEX V5, Block, Python Programming, Workcell

Customizing Robots and Parts

- Tinkercade/Fusion 360, FreeCad(Python coding)
 - 3D Modeling, Electric circuits, Arduino IDE C/Python Code

Workflow Process: Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing

- Inkscape > Tinkercad > Ultimaker Cura > Ultimaker (*print Key fob)
- *Autodesk Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling
- Raspberry Pi Pico Bluetooth/WiFi, Python

Precision Machining

• Manual/Traditional - Mill and Drill

CNC – ComputerNumeric Control –G/M Code

Academic Standards:

AZ CTE

Automation & Robotics
Tech-Standards

STANDARD 2.0
PERFORM ELECTRICAL
AND ELECTRONIC
TASKS

STANDARD 4.0 ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS

STANDARD 7.0
PERFORM DRAFTING
TASKS
7.5 Make dimensional
CAD drawings (e.g., 2D
and 3D)

STANDARD 5.0
DESCRIBE THE
OPERATION AND USE
OF VARIOUS FORMS
OR ELECTRICAL
MOTORS

5.2 Explain the operation and use of DC motors in automation controls

STANDARD 6.0
PERFORM
MECHANICAL
SYSTEMS LINKAGES
TASKS
STANDARD 10.0 APPLY
SENSOR SOLUTIONS

STANDARD 13.0
DEMONSTRATE SAFE
AND PROPER USE OF
ELECTRONIC AND
OTHER LABORATORY
EQUIPMENT, TOOLS,
AND MATERIALS

Tuesday

Collaborate with schools, 'Industry Professional-Community

Notes: ***Hold Robotics Team/Club Meeting this week to discuss: Academic Standards: 12/05/2023 **Review for Test/Az CTE Assessment Blocks (1,4) Dec. 18-19, 2023 AZ CTE *Register Teams VRC Competiton 1/6/24 @ Whiteriver, Alchesay High School *Diamond Back Robotics Competition Spring/Summer Robotic Automation & *PO/Paid/Check Registration VEX V5 Team(s)/VEX Prof+ Access Assemblies **Robotics** Mechatronics Discuss Robotics 11/17-18/23 Competition @ Whiteriver, Chief Alchesay Center Tech-Standards Battlebot Competition with Show Low High School Download Libraries for Thonny IDE on workstations (laptops?) for Pico W Kit Engineering: STANDARD 2.0 SunFounder Raspberry Pi Pico W Ultimate Starter Kit with Online Tutorials. Re-Engineering PERFORM ELECTRICAL 450+ Items, 117 Projects, MicroPython, Piper Make and C/C++ (Compatible Reverse AND ELECTRONIC with Arduino IDE) **TASKS** Engineering Objective: STANDARD 4.0 Structural Apply basic engineering principles and technical skills for... artificial **ANALYZE** Chassis frame intelligent management ...[automation]...the principles of robotics, design, **PROGRAMMABLE** body operational testing, system maintenance, repair procedures, robot LOGIC CONTROLLER computer systems, and control languages. (PLC) SYSTEMS Mechanical (AZ CTE Automation & Robotics-Program Description) (Motion) STANDARD 7.0 Gear: Box, PERFORM ELECTRICAL AND ELECTRONIC TASKS PERFORM DRAFTING train, parallel ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS **TASKS** (linear) stack PERFORM DRAFTING TASKS-Make dimensional CAD drawings (e.g., 2D and 3D) 7.5 Make dimensional (vertical), ratio, DESCRIBE THE OPERATION AND USE OF VARIOUS FORMS OR ELECTRICAL CAD drawings (e.g., 2D torque speed **MOTORS** and 3D) Explain the operation and use of DC motors in automation controls Electrical PERFORM MECHANICAL SYSTEMS LINKAGES TASKS STANDARD 5.0 Chemical APPLY SENSOR SOLUTIONS DESCRIBE THE electrochemical DEMONSTRATE SAFE AND PROPER USE OF ELECTRONIC AND OTHER **OPERATION AND USE** LABORATORY EQUIPMENT, TOOLS, AND MATERIALS OF VARIOUS FORMS Chemical OR ELECTRICAL **Batteries MOTORS Lesson Overview:** Magnetism 1st Semester Students: Login to VEX Certification Accounts: 5.2 Explain the Computer Sci. operation and use of VEX V5, Block, Python Programming, Workcell Hardware/Soft DC motors in Continue building VEX V5 Robots: Striker for Over/Under Competition ware automation controls Coding-Block/Python/C/C++ Block Sensors PLC ladder STANDARD 6.0 logic, CNC, • Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis **PERFORM** Python, C++, 2nd Semester Plus+ Students: MECHANICAL Login to VEX Certification Accounts: SYSTEMS LINKAGES Sensors VEX V5, Block,Python Programming, Workcell TASKS Bump/touch **Customizing Robots and Parts** STANDARD 10.0 APPLY Distance **SENSOR SOLUTIONS** Tinkercade/Fusion 360, FreeCad(Python coding) Light • 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Camera STANDARD 13.0 Workflow Process: Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing **DEMONSTRATE SAFE Physical** Inkscape > Tinkercad > Ultimaker Cura > Ultimaker (*print Key fob) AND PROPER USE OF Computing *Autodesk Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling **ELECTRONIC AND** Raspberry Pi – Pico Bluetooth/WiFi, Python OTHER LABORATORY Data Collect **Precision Machining** EQUIPMENT, TOOLS, DataAnalyze AND MATERIALS Manual/Traditional - Mill and Drill

CNC – ComputerNumeric Control –G/M Code

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with schools, 'Industry **Professionals** Community

***Hold Robotics Team/Club Meeting this week to discuss: Notes: 12/06/2023 **Review for Test/Az CTE Assessment Blocks (1,4) Dec. 18-19, 2023 *Register Teams VRC Competiton 1/6/24 @ Whiteriver, Alchesay High School *Diamond Back Robotics Competition Spring/Summer Robotic Assemblies Mechtronics Engineering: ReEngineering Reverse with Arduino IDE) Engineering Objective: Structural Chassis frame body Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed **MOTORS** Electrical Chemical APPLY SENSOR SOLUTIONS electrochemical Physical Magnetism **Lesson Overview: Batteries** 1st Semester Students: Login to VEX Certification Accounts: Software Block PLC ladder Coding-Block/Python/C/C++ logic, CNC, Sensors Python, C++, Sensors 2nd Semester Plus+ Students: Bump/touchDis • Login to VEX Certification Accounts: tance Light **Customizing Robots and Parts** Camera **Physical** Computing ΑI Data Collect Raspberry Pi – Pico Bluetooth/WiFi, Python DataAnalyze **Precision Machining** Manual/Traditional - Mill and Drill Collaborate CNC – ComputerNumeric Control –G/M Code

*PO/Paid/Check Registration VEX V5 Team(s)/VEX Prof+ Access Discuss Robotics 11/17-18/23 Competition @ Whiteriver, Chief Alchesay Center Battlebot Competition with Show Low High School Download Libraries for Thonny IDE on workstations (laptops?) for Pico W Kit SunFounder Raspberry Pi Pico W Ultimate Starter Kit with Online Tutorials. 450+ Items, 117 Projects, MicroPython, Piper Make and C/C++ (Compatible Apply basic engineering principles and technical skills for... artificial intelligent management ...[automation]...the principles of robotics, design, operational testing, system maintenance, repair procedures, robot computer systems, and control languages. (AZ CTE Automation & Robotics-Program Description) PERFORM ELECTRICAL AND ELECTRONIC TASKS ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS PERFORM DRAFTING TASKS-Make dimensional CAD drawings (e.g., 2D and 3D) DESCRIBE THE OPERATION AND USE OF VARIOUS FORMS OR ELECTRICAL Explain the operation and use of DC motors in automation controls PERFORM MECHANICAL SYSTEMS LINKAGES TASKS DEMONSTRATE SAFE AND PROPER USE OF ELECTRONIC AND OTHER LABORATORY EQUIPMENT, TOOLS, AND MATERIALS VEX V5, Block, Python Programming, Workcell Continue building VEX V5 Robots: Striker for Over/Under Competition • Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis VEX V5, Block,Python Programming, Workcell Tinkercade/Fusion 360, FreeCad(Python coding) • 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Workflow Process: Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Inkscape > Tinkercad > Ultimaker Cura > Ultimaker (*print Key fob) *Autodesk Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling

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		 *Register Teams VRC Competition 1/6/24 @ Whiteriver, Alchesay High School
	Robotic	*Diamond Back Robotics Competition Spring/Summer
	Assemblies	 *PO/Paid/Check Registration VEX V5 Team(s)/VEX Prof+ Access
	Mechtronics	Discuss Robotics 11/17-18/23 Competition @ Whiteriver, Chief Alchesay Center
		Battlebot Competition with Show Low High School
	Engineering:	Download Libraries for Thonny IDE on workstations (laptops?) for Pico W Kit
	ReEngineering	SunFounder Raspberry Pi Pico W Ultimate Starter Kit with Online Tutorials, 117 P
	Reverse	450+ Items, 117 Projects, MicroPython, Piper Make and C/C++ (Compatible with Arduino IDE)
	Engineering	with Ardumo idej
		Objective:
	Structural	Apply basic engineering principles and technical skills for artificial
	Chassis frame	intelligent management[automation]the principles of robotics, design,
	body	
	·	operational testing, system maintenance, repair procedures, robot
	Mechanical	computer systems, and control languages.
	(Motion)	(AZ CTE Automation & Robotics-Program Description)
	Gear: Box,	
	train, parallel	PERFORM ELECTRICAL AND ELECTRONIC TASKS
	(linear) stack	ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS
	(vertical), ratio,	PERFORM DRAFTING TASKS-Make dimensional CAD drawings (e.g., 2D and 3D)
	torque speed	DESCRIBE THE OPERATION AND USE OF VARIOUS FORMS OR ELECTRICAL
	to. que opeca	MOTORS
	Electrical	Explain the operation and use of DC motors in automation controls
	Chemical	PERFORM MECHANICAL SYSTEMS LINKAGES TASKS
	electrochemical	APPLY SENSOR SOLUTIONS
•	electrochemical	DEMONSTRATE SAFE AND PROPER USE OF ELECTRONIC AND OTHER
	DI : 1	LABORATORY EQUIPMENT, TOOLS, AND MATERIALS
	Physical	
	Magnetism	Lesson Overview:
	Batteries	1st Semester Students:
	c (:	Login to VEX Certification Accounts:
	Software	VEX V5, Block, Python Programming, Workcell
	Block	 VEX V5, Block, Python Programming, Workcell Continue building VEX V5 Robots: Striker for Over/Under Competition
	Block PLC ladder	Continue building VEX V5 Robots: Striker for Over/Under Competition
	Block PLC ladder logic, CNC,	Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++
	Block PLC ladder	Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors
	Block PLC ladder logic, CNC, Python, C++,	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis
	Block PLC ladder logic, CNC, Python, C++, Sensors	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students:
	Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDis	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students: Login to VEX Certification Accounts:
	Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDis tance	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students: Login to VEX Certification Accounts: VEX V5, Block,Python Programming, Workcell
	Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDis	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students: Login to VEX Certification Accounts: VEX V5, Block,Python Programming, Workcell Customizing Robots and Parts
	Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDis tance Light	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students: Login to VEX Certification Accounts: VEX V5, Block,Python Programming, Workcell
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	Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDis tance Light Camera	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students: Login to VEX Certification Accounts: VEX V5, Block,Python Programming, Workcell Customizing Robots and Parts Tinkercade/Fusion 360, FreeCad(Python coding)
	Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDis tance Light Camera Physical	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students: Login to VEX Certification Accounts: VEX V5, Block,Python Programming, Workcell Customizing Robots and Parts Tinkercade/Fusion 360, FreeCad(Python coding) 3D Modeling, Electric circuits, Arduino IDE – C/Python Code
	Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDis tance Light Camera Physical	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students: Login to VEX Certification Accounts: VEX V5, Block,Python Programming, Workcell Customizing Robots and Parts Tinkercade/Fusion 360, FreeCad(Python coding) 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Workflow Process: Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Inkscape > Tinkercad > Ultimaker Cura > Ultimaker (*print Key fob)
	Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDis tance Light Camera Physical Computing	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students: Login to VEX Certification Accounts: VEX V5, Block,Python Programming, Workcell Customizing Robots and Parts Tinkercade/Fusion 360, FreeCad(Python coding) 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Workflow Process: Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Inkscape > Tinkercad > Ultimaker Cura > Ultimaker (*print Key fob) *Autodesk Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling
	Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDis tance Light Camera Physical Computing AI	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students: Login to VEX Certification Accounts: VEX V5, Block,Python Programming, Workcell Customizing Robots and Parts Tinkercade/Fusion 360, FreeCad(Python coding) 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Workflow Process: Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Inkscape > Tinkercad > Ultimaker Cura > Ultimaker (*print Key fob) *Autodesk Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling Raspberry Pi – Pico Bluetooth/WiFi, Python
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	Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDis tance Light Camera Physical Computing AI Data Collect DataAnalyze	 Continue building VEX V5 Robots: Striker for Over/Under Competition Coding-Block/Python/C/C++ Sensors Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis 2nd Semester Plus+ Students: Login to VEX Certification Accounts: VEX V5, Block, Python Programming, Workcell Customizing Robots and Parts Tinkercade/Fusion 360, FreeCad(Python coding) 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Workflow Process: Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Inkscape > Tinkercad > Ultimaker Cura > Ultimaker (*print Key fob) *Autodesk Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling Raspberry Pi – Pico Bluetooth/WiFi, Python Precision Machining
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***Hold Robotics Team/Club Meeting this week to discuss:

**Review for Test/<u>Az CTE Assessment</u> Blocks (1,4) Dec. 18-19, 2023

Academic

Standards: AZ_CTE

Automation & Robotics Tech-Standards

STANDARD 2.0
PERFORM ELECTRICAL
AND ELECTRONIC

STANDARD 4.0 ANALYZE

STANDARD 7.0 PERFORM DRAFTING

STANDARD 5.0
DESCRIBE THE
OPERATION AND USE
OF VARIOUS FORMS
OR ELECTRICAL
MOTORS

5.2 Explain the operation and use of DC motors in automation controls

STANDARD 6.0 PERFORM MECHANICAL SYSTEMS LINKAGES

STANDARD 10.0 APPLY SENSOR SOLUTIONS

STANDARD 13.0
DEMONSTRATE SAFE
AND PROPER USE OF
ELECTRONIC AND
OTHER LABORATORY
EQUIPMENT, TOOLS,
AND MATERIAL

TASKS

7.5 Make dimensional CAD drawings (e.g., 2D

TASKS

and 3D)

PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS

TASKS

Notes:

12/07/2023

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Notes: ***Hold Robotics Team/Club Meeting this week to discuss: Academic 12/08/2023 **Review for Test/Az CTE Assessment Blocks (1,4) Dec. 18-19, 2023 Standards: *Register Teams VRC Competiton 1/6/24 @ Whiteriver, Alchesay High School AZ CTE *Diamond Back Robotics Competition Spring/Summer Robotic Assemblies *PO/Paid/Check Registration VEX V5 Team(s)/VEX Prof+ Access Automation & Mechtronics Discuss Robotics 11/17-18/23 Competition @ Whiteriver, Chief Alchesay Center Robotics Battlebot Competition with Show Low High School Tech-Standards Download Libraries for Thonny IDE on workstations (laptops?) for Pico W Kit Engineering: STANDARD 2.0 SunFounder Raspberry Pi Pico W Ultimate Starter Kit with Online Tutorials. ReEngineering PERFORM ELECTRICAL 450+ Items, 117 Projects, MicroPython, Piper Make and C/C++ (Compatible Reverse AND ELECTRONIC with Arduino IDE) Engineering **TASKS** Objective: Structural STANDARD 4.0 Apply basic engineering principles and technical skills for... artificial Chassis frame ANALYZE intelligent management ...[automation]...the principles of robotics, design, body PROGRAMMABLE operational testing, system maintenance, repair procedures, robot LOGIC CONTROLLER computer systems, and control languages. Mechanical (PLC) SYSTEMS (AZ CTE Automation & Robotics-Program Description) (Motion) Gear: Box, STANDARD 7.0 PERFORM ELECTRICAL AND ELECTRONIC TASKS train, parallel PERFORM DRAFTING ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS (linear) stack **TASKS** PERFORM DRAFTING TASKS-Make dimensional CAD drawings (e.g., 2D and 3D) (vertical), ratio, 7.5 Make dimensional DESCRIBE THE OPERATION AND USE OF VARIOUS FORMS OR ELECTRICAL torque speed CAD drawings (e.g., 2D **MOTORS** and 3D) Explain the operation and use of DC motors in automation controls Electrical PERFORM MECHANICAL SYSTEMS LINKAGES TASKS STANDARD 5.0 Chemical APPLY SENSOR SOLUTIONS DESCRIBE THE electrochemical DEMONSTRATE SAFE AND PROPER USE OF ELECTRONIC AND OTHER **OPERATION AND USE** LABORATORY EQUIPMENT, TOOLS, AND MATERIALS OF VARIOUS FORMS Physical OR ELECTRICAL Magnetism **Lesson Overview: MOTORS Batteries** 1st Semester Students: Login to VEX Certification Accounts: 5.2 Explain the Software VEX V5, Block, Python Programming, Workcell operation and use of Block Continue building VEX V5 Robots: Striker for Over/Under Competition DC motors in PLC ladder Coding-Block/Python/C/C++ automation controls logic, CNC, Sensors Python, C++, STANDARD 6.0 • Bump/touch, Distance, Line Tracker, Camera, AI, Data Analysis **PERFORM** Sensors 2nd Semester Plus+ Students: MECHANICAL Bump/touchDis • Login to VEX Certification Accounts: SYSTEMS LINKAGES tance VEX V5, Block,Python Programming, Workcell **TASKS** Light **Customizing Robots and Parts** STANDARD 10.0 APPLY Camera Tinkercade/Fusion 360, FreeCad(Python coding) **SENSOR SOLUTIONS** • 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Physical STANDARD 13.0 Workflow Process: Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Computing **DEMONSTRATE SAFE** Inkscape > Tinkercad > Ultimaker Cura > Ultimaker (*print Key fob) AND PROPER USE OF ΑI *Autodesk Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling **ELECTRONIC AND Data Collect** • Raspberry Pi – Pico Bluetooth/WiFi, Python OTHER LABORATORY DataAnalyze **Precision Machining** EQUIPMENT, TOOLS, Manual/Traditional - Mill and Drill AND MATERIAL Collaborate CNC – ComputerNumeric Control –G/M Code with schools, 'Industry ProfessionalsCo