Name: Robert Lefrandt	Grading Quarter: 1	Week Beginning: 08/06/2024
School Year: 2024-25	Subject: Automation & Robotics/Engineering	

Monday	Notes: Notes: Certifcations: **Robotics (AR)** **Solidworks Engineering** Autodesk Fusion 360 Robotic Assemblies Mechtronics Engineering: ReEngineering Reverse Engineering Structural Chassis frame body Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed Electrical (Ohm's Law, Parallel/Serial Circuits) Chemical electrochemical Physical Magnetism Batteries Software Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touchDistance Light Camera Physical Computing AI Data Collect DataAnalyze Collaborate with schools, 'Industry ProfessionalCommunity	Objective: Students will begin to define what the Automation & Robotics/Engineering Class is and what are the Arizona State Standards, skills, and possible credentials/certifications. Lesson Overview: Automation & Robotics/Engineering: Define What it is. Look at Arizona State Standards Tour Lab & Resources Fabrication Laser Engrave/Cutting/3D Printing Electronics: Arduino B/W/Raspberry Pi Pico B/W (breadboard) Soldering/Desoldering(Reworking) Electronic Circuits (beyond breadboard): Circuits: conductive ink, stickers, engraving, Printed Circuit Boards (PCB), etc.	Academic Standards: **Automation & Robotics** https://www.azed.gov/cte/ar/ **Engineering** https://www.azed.gov/cte/es/

Tuesday	Notes:
	Certifcations:
	Robotics (AR)
	Solidworks Engineering
	Autodesk Fusion 360
	Robotic Assemblies Mechtronics
	
	Engineering:
	ReEngineering
	Reverse Engineering
	
	Structural
	Chassis frame body
	
	Mechanical (Motion)
	Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed
	
	Electrical (Ohm's Law, Parallel/Serial Circuits)
	Chemical
	electrochemical
	
	Physical
	Magnetism
	Batteries
	
	Software
	Block
	PLC ladder logic, CNC, Python, C++,
	
	Sensors
	Bump/touchDistance
	Light
	Camera
	
	Physical Computing
	
	AI
	Data Collect
	DataAnalyze
	
	Collaborate with schools, 'Industry ProfessionalCommunity
		Objective:
		Apply basic engineering principles and technical skills for... artificial intelligent management ...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: Workflow Process:
		Level 1 Students:
		• Login to VEX Certification Accounts:
		• VEX V5 ,Block Programming, Python Programming, Workcell
		  • RemoteCotrol and building VEX V5 Robots -Speedbot/Base Bot
		  • Coding-Block/Python/C/C++
		Sensors :Bump/touch, Distance, Line Tracker, Camera, , AI, Data Analysis
		***Customizing Robots and Parts : After Completing 1st Semester Skills
		Level 2 Plus+ Students:
		• Login to VEX Certification Accounts: (Complete Certifications + Arduino/PCEP)
		• Tinkercade(Autodesk)/PHET(Physics-Engineering-Tech) Univ-Colorado
		• 3D Modeling, Electric circuits, Arduino IDE – C/Python Code
		• Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing
		• Inkscape > Tinkercad > Ultimaker Cura (Settings) > Ultimaker (Print)
		*Autodesk Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling
		• Raspberry Pi – Pico Kit -Bluetooth/WiFi, Python
		Precision Machining CAD/CAM :
		• 3D Printing
		• Manual/Traditional - Mill and Drill ,
		• CNC –ComputerNumeric Control –G/M Code
			Academic Standards:
			
			Arizona Department of Education Website:
			
			Program Description/Industry Credentials/Coherent Sequence/
			
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			www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf
			
			Arizona Career and Technical Education Professional Skills have 9 areas of measurement:
			
			www.azed.gov/cte/profskills/
			
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			1. Communication
			2. Collaboration / Teaming Abilities
			3. Thinking and Innovation / Problem Solving
			4. Professionalism / Formal Behavior
			5. Initiative and Self-Direction / Leadership
			6. Intergenerational and Cross-Cultural Competence / Acceptance and Inclusion
			7. Organizational Culture / Values
			8. Legal and Ethical Practices / Safety
			9. Financial Practices

Wednesday	Notes:
	
	Robotic Assemblies Mechtronics
	
	Engineering: ReEngineering Reverse Engineering
	
	Structural Chassis frame body
	
	Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed
	
	Electrical (Ohm's Law, Parallel/Serial Circuits) Chemical electrochemical
	
	Physical Magnetism Batteries
	
	Software Block PLC ladder logic, CNC, Python, C++,
	
	Sensors Bump/touchDistance Light Camera
	
	Physical Computing
	
	AI Data Collect DataAnalyze
	
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Friday	Notes:
	
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