

Name: Robert Lefrandt	Grading Quarter: 4	Week Beginning: Wk9 05/13/2024
School Year: 2023-24	Subject: Automation & Robotics	

Monday	Notes:	05/13/2024 BRHS Robotics –	Academic Standards:
	<p>Notes:</p> <p>Robotic Assemblies Mechtronics</p> <p>Engineering: ReEngineering Reverse Engineering</p> <p>Structural Chassis frame body</p> <p>Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed</p> <p>Electrical (Ohm's Law, Parallel/Serial Circuits) Chemical electrochemical</p> <p>Physical Magnetism Batteries</p> <p>Software Block PLC ladder logic, CNC, Python, C++,</p> <p>Sensors Bump/touchDistance Light Camera</p> <p>Physical Computing</p> <p>AI Data Collect DataAnalyze</p> <p>Collaborate with schools, 'Industry ProfessionalCommunity</p> <p>NASA, Honeywell</p>	<p>Objective: Apply basic engineering principles and technical skills for... artificial intelligent (AI) management ...the principles of robotics, design, operational testing, system maintenance, repair procedures, robot computer systems, and control languages.</p> <p>(AZ CTE Automation & Robotics-Program Description)</p> <ul style="list-style-type: none"> PERFORM ELECTRICAL AND ELECTRONIC TASKS ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS & (Block, C/C++, Python) 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 <p>Lesson Overview: Workflow Process:</p> <p>1st Semester Students:</p> <ul style="list-style-type: none"> Login to VEX Certification Accounts: VEX V5 ,Block Programming, Python Programming, Workcell Remote Control and building VEX V5 Robots -Speedbot/Base Bot Coding-Block/Python/C/C++ Vexcode, vr.vex.com (sim) team# & code, over/under playground, scoring, sensors Sensors :Bump/touch, (New)Distance/(Old)Rangefinder, Line Tracker, Camera, , AI, Data Analysis Industrial Internet of Things (IIOT) R-Pi & Arduino kits <p>***Customizing Robots and Parts : After Completing 1st Semester Skills</p> <p>2nd Semester Plus+ Students:</p> <ul style="list-style-type: none"> Custom: <ul style="list-style-type: none"> Battlebots, solder Flywheel, trebuchet, catapult, striker (intake) Login to VEX Certification Accounts: (Complete Certifications) Tinkercade(Autodesk)/PHET(Physics-Engineering-Tech) Univ-Colorado 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Prototyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Inkscape > Tinkercad > Ultimaker Cura > Ultimaker Autodesk Tinkercad Team Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling Arduino R4 W (C/C++)/Raspberry Pi – Pico Bluetooth/WiFi (Python) IOT: House Starter kits, Radio, Speakers (bluetooth) <p>Precision Machining :</p> <ul style="list-style-type: none"> Manual/Traditional - Mill and Drill , Pen Kit CNC –ComputerNumeric Control –G/M Code <ul style="list-style-type: none"> eXpertMill VMC-0600 Milling Machine <ul style="list-style-type: none"> Reinstall software/ReplaceComputer Workstation w/compatible card slot 	<p>Arizona Department of Education Website:</p> <p>Program Description/Industry Credentials/Coherent Sequence/</p> <p>www.azed.gov/cte/ar/</p> <p>www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf</p> <p>Arizona Career and Technical Education Professional Skills have 9 areas of measurement:</p> <p>www.azed.gov/cte/profskills/</p> <p>www.azed.gov/sites/default/files/2022/08/PrintablePreassessment.pdf</p> <ol style="list-style-type: none"> Communication Collaboration / Teaming Abilities Thinking and Innovation / Problem Solving Professionalism / Formal Behavior Initiative and Self-Direction / Leadership Intergenerational and Cross-Cultural Competence / Acceptance and Inclusion Organizational Culture / Values Legal and Ethical Practices / Safety Financial Practices

--	--	--	--

Tuesday	Notes:	05/14/2024 -	Academic Standards:
	<p>Robotic Assemblies Mechtronics</p> <p>Engineering: ReEngineering Reverse Engineering</p> <p>Structural Chassis frame body</p> <p>Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed</p> <p>Electrical (Ohm's Law, Parallel/Serial Circuits) Chemical electrochemical</p> <p>Physical Magnetism Batteries</p> <p>Software Block PLC ladder logic, CNC, Python, C++,</p> <p>Sensors Bump/touchDistance Light Camera</p> <p>Physical Computing</p> <p>AI Data Collect DataAnalyze</p> <p>Collaborate with schools, 'Industry ProfessionalCommunity</p> <p>NASA, Honeywell</p>	<p>Objective: Apply basic engineering principles and technical skills for... artificial intelligent (AI) management ...the principles of robotics, design, operational testing, system maintenance, repair procedures, robot computer systems, and control languages.</p> <p>(AZ CTE Automation & Robotics-Program Description)</p> <ul style="list-style-type: none"> PERFORM ELECTRICAL AND ELECTRONIC TASKS ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS <u>& (Block, C/C++, Python)</u> 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 <p>Lesson Overview: Workflow Process:</p> <p>1st Semester Students:</p> <ul style="list-style-type: none"> 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++ Vexcode, vr.vex.com (sim) team# & code, over/under playground, scoring, sensors Sensors :Bump/touch,(New)Distance/(Old)Rangefinder, Line Tracker, Camera, , AI, Data Analysis Industrial Internet of Things (IIOT) R-Pi & Arduino kits <p><u>***Customizing Robots and Parts : After Completing 1st Semester Skills</u></p> <p>2nd Semester Plus+ Students:</p> <ul style="list-style-type: none"> Custom: <ul style="list-style-type: none"> Battlebots, solder Flywheel treuchet, catapult, striker (intake) Login to VEX Certification Accounts: (Complete Certifications) Tinkercade(Autodesk)/PHET(Physics-Engineering-Tech) Univ-Colorado 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Prototyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Inkscape > Tinkercad > Ultimaker Cura > Ultimaker Autodesk Tinkercad Team Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling Arduino R4 W (C/C++)/Raspberry Pi – Pico Bluetooth/WiFi (Python) IOT: House Starter kits, Radio, Speakers (bluetooth) <p>Precision Machining :</p> <ul style="list-style-type: none"> Manual/Traditional - Mill and Drill , Pen Kit CNC –ComputerNumeric Control –G/M Code <ul style="list-style-type: none"> eXpertMill VMC-0600 Milling Machine <ul style="list-style-type: none"> Reinstall software/ReplaceComputer Workstation w/compatible card slot 	<p>Arizona Department of Education Website:</p> <p>Program Description/Industry Credentials/Coherent Sequence/</p> <p>www.azed.gov/cte/ar/</p> <p>www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf</p> <p><u>Arizona Career and Technical Education Professional Skills</u> <u>have 9 areas of measurement:</u></p> <p>www.azed.gov/cte/profskills/</p> <p>www.azed.gov/sites/default/files/2022/08/PrintablePreassessment.pdf</p> <ol style="list-style-type: none"> Communication Collaboration / Teaming Abilities Thinking and Innovation / Problem Solving Professionalism / Formal Behavior Initiative and Self-Direction / Leadership Intergenerational and Cross-Cultural Competence / Acceptance and Inclusion Organizational Culture / Values Legal and Ethical Practices / Safety Financial Practices

Wednesday	Notes:	05/15/2024-	Academic Standards:
	<p>Robotic Assemblies Mechtronics</p> <p>Engineering: ReEngineering Reverse Engineering</p> <p>Structural Chassis frame body</p> <p>Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed</p> <p>Electrical (Ohm's Law, Parallel/Serial Circuits) Chemical electrochemical</p> <p>Physical Magnetism Batteries</p> <p>Software Block PLC ladder logic, CNC, Python, C++,</p> <p>Sensors Bump/touchDistance Light Camera</p> <p>Physical Computing</p> <p>AI Data Collect DataAnalyze</p> <p>Collaborate with schools, 'Industry ProfessionalCommunity</p> <p>NASA, Honeywell</p>	<p>Objective: Apply basic engineering principles and technical skills for... artificial intelligent (AI) management ...the principles of robotics, design, operational testing, system maintenance, repair procedures, robot computer systems, and control languages.</p> <p>(AZ CTE Automation & Robotics-Program Description)</p> <ul style="list-style-type: none"> PERFORM ELECTRICAL AND ELECTRONIC TASKS ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS <u>& (Block, C/C++, Python)</u> 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 <p>Lesson Overview: Workflow Process:</p> <p>1st Semester Students:</p> <ul style="list-style-type: none"> 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++ Vexcode, vr.vex.com (sim) team# & code, over/under playground, scoring, sensors Sensors :Bump/touch, (New)Distance/(Old)Rangefinder, Line Tracker, Camera, , AI, Data Analysis Industrial Internet of Things (IIOT) R-Pi & Arduino kits <p><u>***Customizing Robots and Parts : After Completing 1st Semester Skills</u></p> <p>2nd Semester Plus+ Students:</p> <ul style="list-style-type: none"> Custom: <ul style="list-style-type: none"> Battlebots, solder Flywheel, treuchet, catapult, striker (intake) Login to VEX Certification Accounts: (Complete Certifications) Tinkercade(Autodesk)/PHET(Physics-Engineering-Tech) Univ-Colorado 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Prototyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Inkscape > Tinkercad > Ultimaker Cura > Ultimaker Autodesk Tinkercad Team Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling Arduino R4 W (C/C++)/Raspberry Pi – Pico Bluetooth/WiFi (Python) IOT: House Starter kits, Radio, Speakers (bluetooth) <p>Precision Machining :</p> <ul style="list-style-type: none"> Manual/Traditional - Mill and Drill , Pen Kit CNC –ComputerNumeric Control –G/M Code <ul style="list-style-type: none"> eXpertMill VMC-0600 Milling Machine <ul style="list-style-type: none"> Reinstall software/ReplaceComputer Workstation w/compatible card slot 	<p>Arizona Department of Education Website:</p> <p>Program Description/Industry Credentials/Coherent Sequence/</p> <p>www.azed.gov/cte/ar/</p> <p>www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf</p> <p><u>Arizona Career and Technical Education Professional Skills</u> <u>have 9 areas of measurement:</u></p> <p>www.azed.gov/cte/profskills/</p> <p>www.azed.gov/sites/default/files/2022/08/PrintablePreassessment.pdf</p> <ol style="list-style-type: none"> Communication Collaboration / Teaming Abilities Thinking and Innovation / Problem Solving Professionalism / Formal Behavior Initiative and Self-Direction / Leadership Intergenerational and Cross-Cultural Competence / Acceptance and Inclusion Organizational Culture / Values Legal and Ethical Practices / Safety Financial Practices

Thursday	<p>Notes:</p> <p>Robotic Assemblies Mechtronics</p> <p>Engineering: ReEngineering Reverse Engineering</p> <p>Structural Chassis frame body</p> <p>Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed</p> <p>Electrical (Ohm's Law, Parallel/Serial Circuits) Chemical electrochemical</p> <p>Physical Magnetism Batteries</p> <p>Software Block PLC ladder logic, CNC, Python, C++,</p> <p>Sensors Bump/touchDistance Light Camera</p> <p>Physical Computing</p> <p>AI Data Collect DataAnalyze</p> <p>Collaborate with schools, 'Industry ProfessionalCommunity</p> <p>NASA, Honeywell</p>	<p>05/16/2024-</p> <p>Objective: Apply basic engineering principles and technical skills for... artificial intelligent (AI) management ...the principles of robotics, design, operational testing, system maintenance, repair procedures, robot computer systems, and control languages.</p> <p>(AZ CTE Automation & Robotics-Program Description)</p> <ul style="list-style-type: none"> PERFORM ELECTRICAL AND ELECTRONIC TASKS ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS & (Block, C/C++, Python) 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 <p>Lesson Overview: Workflow Process:</p> <p>1st Semester Students:</p> <ul style="list-style-type: none"> 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++ Vexcode, vr.vex.com (sim) team# & code, over/under playground, scoring, sensors Sensors :Bump/touch, (New)Distance/(Old)Rangefinder, Line Tracker, Camera, , AI, Data Analysis Industrial Internet of Things (IIOT) R-Pi & Arduino kits <p>***Customizing Robots and Parts : After Completing 1st Semester Skills</p> <p>2nd Semester Plus+ Students:</p> <ul style="list-style-type: none"> Custom: <ul style="list-style-type: none"> Battlebots, solder Flywheel treuchet, catapult, striker (intake) Login to VEX Certification Accounts: (Complete Certifications) Tinkercade(Autodesk)/PHET(Physics-Engineering-Tech) Univ-Colorado 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Prototyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Inkscape > Tinkercad > Ultimaker Cura > Ultimaker Autodesk Tinkercad Team Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling Arduino R4 W (C/C++)/Raspberry Pi – Pico Bluetooth/WiFi (Python) IOT: House Starter kits, Radio, Speakers (bluetooth) <p>Precision Machining :</p> <ul style="list-style-type: none"> Manual/Traditional - Mill and Drill , Pen Kit CNC –ComputerNumeric Control –G/M Code <ul style="list-style-type: none"> eXpertMill VMC-0600 Milling Machine <ul style="list-style-type: none"> Reinstall software/ReplaceComputer Workstation w/compatible card slot 	<p>Academic Standards:</p> <p>Arizona Department of Education Website:</p> <p>Program Description/Industry Credentials/Coherent Sequence/</p> <p>www.azed.gov/cte/ar/</p> <p>www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf</p> <p><u>Arizona Career and Technical Education Professional Skills have 9 areas of measurement:</u></p> <p>www.azed.gov/cte/profskills/</p> <p>www.azed.gov/sites/default/files/2022/08/PrintablePreassessment.pdf</p> <ol style="list-style-type: none"> Communication Collaboration / Teaming Abilities Thinking and Innovation / Problem Solving Professionalism / Formal Behavior Initiative and Self-Direction / Leadership Intergenerational and Cross-Cultural Competence / Acceptance and Inclusion Organizational Culture / Values Legal and Ethical Practices / Safety <u>Financial Practices</u>
----------	---	--	---

--	--	--	--

Friday	<p>Notes:</p> <p>Robotic Assemblies Mechtronics</p> <p>Engineering: ReEngineering Reverse Engineering</p> <p>Structural Chassis frame body</p> <p>Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed</p> <p>Electrical (Ohm's Law, Parallel/Serial Circuits) Chemical electrochemical</p> <p>Physical Magnetism Batteries</p> <p>Software Block PLC ladder logic, CNC, Python, C++, Sensors Bump/touch Distance Light Camera</p> <p>Physical Computing AI</p> <p>Data Collect DataAnalyze</p> <p>Collaborate with schools, 'Industry ProfessionalCommunity</p> <p>NASA, Honeywell</p>	<p>05/17/2024-</p> <p>Objective: Apply basic engineering principles and technical skills for... artificial intelligent (AI) management ...the principles of robotics, design, operational testing, system maintenance, repair procedures, robot computer systems, and control languages.</p> <p>(AZ CTE Automation & Robotics-Program Description)</p> <ul style="list-style-type: none"> • PERFORM ELECTRICAL AND ELECTRONIC TASKS • ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS & (Block, C/C++, Python) • 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 <p>Lesson Overview: Workflow Process:</p> <p>1st Semester Students:</p> <ul style="list-style-type: none"> • 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++ • Vexcode, vr.vex.com (sim) team# & code, over/under playground, scoring, sensors • Sensors :Bump/touch, (New)Distance/(Old)Rangefinder, Line Tracker, Camera, AI, Data Analysis • Industrial Internet of Things (IIOT) R-Pi & Arduino kits <p>***Customizing Robots and Parts : After Completing 1st Semester Skills</p> <p>2nd Semester Plus+ Students:</p> <ul style="list-style-type: none"> • Custom: <ul style="list-style-type: none"> ◦ Battlebots, solder ◦ Flywheel treuchet, catapult, striker (intake) • Login to VEX Certification Accounts: (Complete Certifications) • Tinkercade(Autodesk)/PHET(Physics-Engineering-Tech) Univ-Colorado • 3D Modeling, Electric circuits, Arduino IDE – C/Python Code • Prototyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing • Inkscape > Tinkercad > Ultimaker Cura > Ultimaker • Autodesk Tinkercad Team Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling • Arduino R4 W (C/C++)/Raspberry Pi – Pico Bluetooth/WiFi (Python) • IOT: House Starter kits, Radio, Speakers (bluetooth) <p>Precision Machining :</p> <ul style="list-style-type: none"> • Manual/Traditional - Mill and Drill , Pen Kit • CNC –ComputerNumeric Control –G/M Code <ul style="list-style-type: none"> ◦ eXpertMill VMC-0600 Milling Machine <ul style="list-style-type: none"> ▪ Reinstall software/ReplaceComputer Workstation w/compatible card slot 	<p>Academic Standards:</p> <p>Arizona Department of Education Website:</p> <p>Program Description/Industry Credentials/Coherent Sequence/</p> <p>www.azed.gov/cte/ar/</p> <p>www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf</p> <p><u>Arizona Career and Technical Education Professional Skills have 9 areas of measurement:</u></p> <p>www.azed.gov/cte/profskills/</p> <p>www.azed.gov/sites/default/files/2022/08/PrintablePreassessment.pdf</p> <ol style="list-style-type: none"> 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
--------	---	---	--