Name: Robert Lefrandt	Grading Quarter: 3	Week Beginning: 1/06/2025
School Year: 2024-25	Subject: Automation & Robotics/Engineering	

| Monday | Notes:
Robotic Assemblies Mechtronic

Engineer: ReEngineer Reverse Engineering Structural Chassis frame body Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed

Mechtronic

Electrical (Ohm's Law, Parallel/Serial Circuits) Chemical e-chem Physical Magnetism Batteries Software

Block PLC ladder logic, CNC, Python, C++ Sensors touch, Dist Light, Camera | *Prof. Dev. No school -**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 (2D/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 V5Robots -Speedbot/Base Bot, Claw 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
Manual/Traditional - Mill and Drill , CNC –ComputerNumeric Control – G/M Code
Raspberry Pi – Pico Kit -Bluetooth/WiFi, Python Precision Machining CAD/CAM : 3D Printing

Competitions: See FabLab/Engineering: Registered Teams: VEX V5_AlchesayHS. 1/11–5 teams, Bus Transportation | Academic Standards:

Arizona Department of Education Website:

Program Description/ Industry Credentials/ Coherent Sequence/

www.azed.gov/cte/ar/

www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf

Az CTE Prof. Skills have 9 areas of measuremnt

Notes Conti:
PhysComp Embedded smart, IIOT AI ,Data Collect Data Analyze Data MachinLearn Collaborate schools,

Industry Community |

		Other: Racing the Sun (RTS) *See FabLab	

| Tuesday | Notes:
Robotic Assemblies Mechtronic

Engineer: ReEngineer 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 e-chem Physical Magnetism Batteries Software

Block PLC ladder logic, CNC, Python, C++ Sensors touch, Dist Light, Camera PhysComp Embedded smart, IIOT | **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 (2D/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 V5Robots -Speedbot/Base Bot, Claw 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
Manual/Traditional - Mill and Drill , CNC –ComputerNumeric Control – G/M Code
Raspberry Pi – Pico Kit -Bluetooth/WiFi, Python Precision Machining CAD/CAM : 3D Printing

Competitions: See FabLab/Engineering: Registered Teams: VEX V5_AlchesayHS. 1/11–5 teams, Bus Transportation | Academic Standards:

Arizona Department of Education Website:

Program Description/ Industry Credentials/ Coherent Sequence/

www.azed.gov/cte/ar/

www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf

Az CTE Prof. Skills have 9 areas of measuremnt

Notes Conti:
AI ,Data Collect Data Analyze Data MachinLearn Collaborate schools,

Industry Community |

		Other: Racing the Sun (RTS) *See FabLab	

| Wednesday | Notes:
Robotic Assemblies Mechtronic

Engineer: ReEngineer 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 e-chem Physical Magnetism Batteries Software

Block PLC ladder logic, CNC, Python, C++ Sensors touch, Dist Light, Camera PhysComp Embedded smart, IIOT | **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 (2D/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 V5Robots -Speedbot/Base Bot, Claw 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
Manual/Traditional - Mill and Drill , CNC –ComputerNumeric Control – G/M Code
Raspberry Pi – Pico Kit -Bluetooth/WiFi, Python Precision Machining CAD/CAM : 3D Printing

Competitions: See FabLab/Engineering: ==*Registered Teams: VEX V5_AlchesayHS. 1/11–5 teams, Bus Transportation*== | Academic Standards:

Arizona Department of Education Website:

Program Description/ Industry Credentials/ Coherent Sequence/

www.azed.gov/cte/ar/

www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf

Az CTE Prof. Skills have 9 areas of measuremnt

Notes Conti:
AI ,Data Collect Data Analyze Data MachinLearn Collaborate schools,

Industry Community |

		Other: Racing the Sun (RTS) *See FabLab	

| Thursday | Notes: Robotic Assemblies Mechtronic Engineer: ReEngineer 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 e-chem Physical Magnetism Batteries Software Block PLC ladder logic, CNC, Python, C++ Sensors touch, Dist Light, Camera PhysComp Embedded smart, IIOT | **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 (2D/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 V5Robots -Speedbot/Base Bot, Claw 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 Manual/Traditional - Mill and Drill , CNC –ComputerNumeric Control – G/M Code Raspberry Pi – Pico Kit -Bluetooth/WiFi, Python Precision Machining CAD/CAM : 3D Printing *Competitions: See FabLab/Engineering: ==Registered Teams: VEX V5_AlchesayHS. 1/11–5 teams, Bus Transportation==* | Academic Standards: Arizona Department of Education Website: Program Description/ Industry Credentials/ Coherent Sequence/ www.azed.gov/cte/ar/ www.azed.gov/sites/default/files/2021/06/ProgramDescription _Automation AndRobotics.pdf Az CTE Prof. Skills have 9 areas of measuremnt Notes Conti: AI ,Data Collect Data Analyze Data MachinLearn Collaborate schools, Industry Community |

		Other: Racing the Sun (RTS) *See FabLab	

| Friday | Notes: Robotic Assemblies Mechtronic

Engineer: ReEngineer 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 e-chem Physical Magnetism Batteries Software

Block/PLC ladder logic, CNC, Python, C++ Sensors bump/touch DistLight, Camera | **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 (2D/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 V5Robots -Speedbot/Base Bot, Claw 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
Manual/Traditional - Mill and Drill , CNC –ComputerNumeric Control – G/M Code
Raspberry Pi – Pico Kit -Bluetooth/WiFi, Python Precision Machining CAD/CAM : 3D Printing

Competitions: See FabLab/Engineering: ==Registered Teams: VEX V5_AlchesayHS. 1/11–5 teams, Bus Transportation== | Academic Standards:

Arizona Department of Education Website:

Program Description/ Industry Credentials/ Coherent Sequence/

www.azed.gov/cte/ar/

www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf

Az CTE Prof. Skills have 9 areas of measuremnt

Notes Conti: PhysComp Embedded smart, IIOT AI ,Data Collect Data Analyze Data MachinLearn Collaborate schools, Industry Community |

		Other: Racing the Sun (RTS) *See FabLab	