Name: Robert Lefrandt	Grading Quarter: 2	Week Beginning: 11/11/2024
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 | **Teacher Professional Development**
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 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 Modeling
Manual/Traditional - Mill and Drill , CNC –ComputerNumeric Control – G/M Code
Raspberry Pi – Pico Kit -Bluetooth/WiFi, Python Precision Machining CAD/CAM : 3D Printing | 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 |

		*Competitions Prep, etc. See FabLab/Engineering <mark>11/14-16/WRiv,</mark>	

Tuesday	Notes:	Objective:	Academic Standards:
	Robotic Assemblies Mechtronic	**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.	Arizona Department of Education Website:
	Engineer: ReEngineer Reverse Engineering Structural Chassis frame body Mechanical (Motion) Gear: Box, train, parallel (linear) stack (vertical), ratio, torque speed	(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	Program Description/ Industry Credentials/ Coherent Sequence/ www.azed.gov/cte/ar/ www.azed.gov/sites/default/files/2021/06/ProgramDescription_AutomationAndRobotics.pdf
	Electrical (Ohm's Law, Parallel/Serial Circuits) Chemical e-chem Physical Magnetism Batteries Software	**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	Az CTE Prof. Skills have 9 areas of measuremnt
	Block PLC ladder logic, CNC, Python, C++ Sensors touch, Dist Light, Camera PhysComp Embedded smart, IIOT	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 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 Prep, etc. See FabLab/Engineering*==11/14-16/24 WRiv==	Notes Conti: AI ,Data Collect Data Analyze Data MachinLearn Collaborate schools, Industry Community

| 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 (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 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 Modeling
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 Prep, etc. See FabLab/Engineering <mark>11/14-16/24 WRiv</mark> | 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 |

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.	Academic Standards:

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 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 Modeling

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 Prep, etc. See FabLab/Engineering 11/14-16/24 WRiv

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

| 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 (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 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 Modeling

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 Prep, etc. See FabLab/Engineering ==11/14-16/24 WRiv== | 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 |