Name:	Grading Quarter:	Week Beginning:
Robert Lefrandt	1	01/22/2024
School Year: 2023-24	Subject: Automation	on & Robotics

Notes:

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/touchDista nce Light Camera

Physical Computing

AI Data Collect DataAnalyze

Collaborate with schools, 'Industry ProfessionalCom munity

NASA, Honeywell

01/22/2024 BRHS Robotics -

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:

1st Semester 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

2nd Semester Plus+ Students:

- Login to VEX Certification Accounts: (Complete Certifications)
- 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 > Ultimaker

*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:

Academic Standards:

Arizona
Department of
Education
Website:

Program
Description/Indust
ry
Credentials/Coher
ent Sequence/

www.azed.gov/cte/ar/

www.azed.gov/sites /default/files/2021/ 06/ProgramDescript ion_AutomationAnd Robotics.pdf

Arizona Career and Technical Education Professional Skills have 9 areas of measurement:

www.azed.gov/cte /profskills/

www.azed.gov/site s/default/files/202 2/08/PrintablePrea ssessment.pdf

- Communication
 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
- Financial Practices

NASA, Honeywell

Academic Notes: 01/23/2024 -Standards: Objective: Robotic Apply basic engineering principles and technical skills for... artificial intelligent Arizona Assemblies Department of management ...the principles of robotics, design, operational testing, system Mechtronics Education maintenance, repair procedures, robot computer systems, and control Website: Engineering: languages. ReEngineering Program Reverse Description/Indust Engineering (AZ CTE Automation & Robotics-Program Description) Credentials/Coher Structural PERFORM ELECTRICAL AND ELECTRONIC TASKS ent Sequence/ Chassis frame ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS body www.azed.gov/cte/ PERFORM DRAFTING TASKS-Make dimensional CAD drawings (e.g., 2D and ar/ Mechanical (Motion) www.azed.gov/sites Gear: Box, train, DESCRIBE THE OPERATION AND USE OF VARIOUS FORMS OR ELECTRICAL /default/files/2021/ parallel (linear) 06/ProgramDescript **MOTORS** stack (vertical), ion_AutomationAnd ratio, torque Robotics.pdf Explain the operation and use of DC motors in automation controls speed PERFORM MECHANICAL SYSTEMS LINKAGES TASKS **Arizona Career and Technical Education APPLY SENSOR SOLUTIONS** Electrical (Ohm's **Professional Skills** DEMONSTRATE SAFE AND PROPER USE OF ELECTRONIC AND OTHER have 9 areas of Law, Parallel/Serial measurement: LABORATORY EQUIPMENT, TOOLS, AND MATERIALS Circuits) www.azed.gov/cte **Lesson Overview:** Workflow Process: Chemical /profskills/ electrochemical 1st Semester Students: www.azed.gov/site • Login to VEX Certification Accounts: Physical s/default/files/202 2/08/PrintablePrea Magnetism VEX V5 ,Block Programming, Python Programming, Workcell ssessment.pdf Batteries RemoteCotrol and building VEX V5 Robots -Speedbot/Base Bot 1. Communication Coding-Block/Python/C/C++ 2. Collaboration / Software **Teaming Abilities** Sensors: Bump/touch, Distance, Line Tracker, Camera, , AI, Data Analysis Block 3. Thinking and PLC ladder logic, Innovation / ***Customizing Robots and Parts: After Completing 1st Semester Skills CNC, Python, **Problem Solving** C++, 4. Professionalism / 2nd Semester Plus+ Students: Formal Behavior 5. Initiative and Sensors • Login to VEX Certification Accounts: (Complete Certifications) Self-Direction / Bump/touchDista Leadership nce Tinkercade(Autodesk)/PHET(Physics-Engineering-Tech) Univ-Colorado 6. Intergenerational Light and Cross-Cultural Camera 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Competence / Acceptance and Inclusion Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing 7. Organizational Physical Culture / Values Inkscape > Tinkercad > Ultimaker Cura > Ultimaker Computing 8. Legal and Ethical Practices / Safety *Autodesk Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling 9. Financial **Practices** • Raspberry Pi - Pico Bluetooth/WiFi **Data Collect** DataAnalyze Python Precision Machining: Collaborate with schools, 'Industry ProfessionalCom Manual/Traditional - Mill and Drill, munity

CNC –ComputerNumeric Control –G/M Code

Notes:

Robotic Assemblies Mechtronics

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01/24/2024-

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www.azed.gov/cte /profskills/

www.azed.gov/site s/default/files/202 2/08/PrintablePrea ssessment.pdf

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

Notes: 01/25/2024-Academic Standards: Robotic **Objective:** Assemblies Apply basic engineering principles and technical skills for... artificial intelligent Arizona Mechtronics Department of management ...the principles of robotics, design, operational testing, system Education Engineering: Website: maintenance, repair procedures, robot computer systems, and control ReEngineering Reverse languages. Program Engineering Description/Indust (AZ CTE Automation & Robotics-Program Description) Structural Chassis frame Credentials/Coher PERFORM ELECTRICAL AND ELECTRONIC TASKS body ent Sequence/ ANALYZE PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEMS Mechanical www.azed.gov/cte/ PERFORM DRAFTING TASKS-Make dimensional CAD drawings (e.g., 2D and 3D) (Motion) ar/ DESCRIBE THE OPERATION AND USE OF VARIOUS FORMS OR ELECTRICAL MOTORS Gear: Box, train, parallel (linear) www.azed.gov/sites Explain the operation and use of DC motors in automation controls stack (vertical), /default/files/2021/ PERFORM MECHANICAL SYSTEMS LINKAGES TASKS 06/ProgramDescript ratio, torque **APPLY SENSOR SOLUTIONS** ion AutomationAnd speed DEMONSTRATE SAFE AND PROPER USE OF ELECTRONIC AND OTHER LABORATORY EQUIPMENT, Robotics.pdf TOOLS, AND MATERIALS **Arizona Career and** Electrical (Ohm's **Lesson Overview:** Workflow Process: **Technical Education** Law, **Professional Skills** 1st Semester Students: Parallel/Serial have 9 areas of Circuits) • Login to VEX Certification Accounts: measurement: Chemical VEX V5 ,Block Programming, Python Programming, Workcell www.azed.gov/cte electrochemical /profskills/ • RemoteCotrol and building VEX V5 Robots -Speedbot/Base Bot Physical Coding-Block/Python/C/C++ www.azed.gov/site Magnetism s/default/files/202 **Batteries** Sensors: Bump/touch, Distance, Line Tracker, Camera, , AI, Data Analysis 2/08/PrintablePrea ssessment.pdf ***Customizing Robots and Parts: After Completing 1st Semester Skills Software 1. Communication 2nd Semester Plus+ Students: Block 2. Collaboration / **Teaming Abilities** PLC ladder logic, Login to VEX Certification Accounts: (Complete Certifications + Arduino/PCEP) 3. Thinking and CNC, Python, Innovation / C++, Tinkercade(Autodesk)/PHET(Physics-Engineering-Tech) Univ-Colorado **Problem Solving** 4. Professionalism / Sensors 3D Modeling, Electric circuits, Arduino IDE – C/Python Code Formal Behavior Bump/touchDista 5. Initiative and Self-Direction / nce Protyping: 2D Sketch > 3D Modeling > 3D Settings > 3D Printing Leadership Light 6. Intergenerational Camera Inkscape > Tinkercad > Ultimaker Cura > Ultimaker and Cross-Cultural Competence / *Autodesk Fusion 360/Solidworks: Combine 2d Sketch/3D Modeling Acceptance and Inclusion Physical Raspberry Pi – Pico Kit -Bluetooth/WiFi, Python 7. Organizational Computing Culture / Values 8. Legal and Ethical Precision Machining:

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Practices

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Block
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Light
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NASA, Honeywell

01/26/2024-

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 and Cross-Cultural
- Inclusion
 7. Organizational
 Culture / Values
 8. Legal and Ethical

Competence /

Acceptance and

Practices / Safety 9. Financial Practices