

Standards Correlations

Mechatronics II (8555)

| Task | SOL Correlations |
|---|---|
| Demonstrating Personal Qualities and Abilities | |
| Demonstrate creativity and innovation. | English: 6.1, 6.3, 6.4, 6.6, 6.7, 6.9, 7.1, 7.3, 7.4, 7.6, 7.7, 7.9, 8.1, 8.3, 8.4, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WG.4, WHI.1, WHII.1 Mathematics: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.10, 6.11, 6.12, 7.2, 7.3, 7.8, 7.9, 8.2, 8.4, 8.6, 8.7, 8.11, 8.12, 8.17, 8.18, A.9, AFDA.3, AFDA.4, AFDA.5, AFDA.6, AFDA.7, AFDA.8, AII.9, COM.1, COM.3, COM.4, COM.5, COM.8, DM.7, DM.1*, DM.10, DM.2*, DM.3*, PS.3*, PS.4*, PS.7*, PS.9*, PS.10* Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1 |
| Demonstrate critical thinking and problem solving. | English: 6.1, 6.3, 6.4, 6.5, 6.6, 6.7, 6.9, 7.1, 7.3, 7.4, 7.5, 7.6, 7.7, 7.9, 8.1, 8.3, 8.4, 8.5, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WG.4, WHI.1, WHII.1 Mathematics: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.10, 6.11, 7.2, 7.3, 7.8, 7.12, 7.13, 8.2, 8.4, 8.8, 8.9, 8.10, 8.11, A.8, A.9, G.1, G.13, G.14, AFDA.3, AFDA.5, AFDA.8, AII.9, AII.10, AII.11, COM.1, COM.3, COM.4, COM.5, COM.8, DM.4, DM.7, DM.1*, DM.2*, DM.3*, DM.9*, PS.9*, PS.10* Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1 |
| Demonstrate initiative and self-direction. | English: 6.1, 6.4, 6.6, 6.7, 6.9, 7.1, 7.4, 7.6, 7.7, 7.9, 8.1, 8.4, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8 |

| Task | SOL Correlations |
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| | History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 |
| Demonstrate integrity. | English: 6.1, 7.1, 8.1, 9.1, 9.5, 10.1, 10.5, 11.1, 11.5, 12.1, 12.5 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 |
| Demonstrate work ethic. | English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: CH.1 |
| Demonstrating Interpersonal Skills | |
| Demonstrate conflict-resolution skills. | English: 6.1, 6.2, 6.4, 6.6, 6.7, 6.9, 7.1, 7.2, 7.4, 7.6, 7.7, 7.9, 8.1, 8.2, 8.4, 8.6, 8.7, 8.9, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, VUS.1 |
| Demonstrate listening and speaking skills. | English: 6.1, 6.2, 6.4, 6.6, 7.1, 7.2, 7.4, 7.6, 8.1, 8.2, 8.4, 8.6, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 |
| Demonstrate respect for diversity. | English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, USII.9, VUS.1, VUS.13, WG.1, WHI.1, WHII.1 |
| Demonstrate customer service skills. | English: 6.1, 6.4, 6.7, 7.1, 7.4, 7.7, 8.1, 8.4, 8.7, 9.1, 9.5, 9.6, 10.1, 10.5, 10.6, 11.1, 11.5, 11.6, 12.1, 12.5, 12.6 History and Social Science: CE.1, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 |
| Collaborate with team members | English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 |
| Demonstrating Professional Competencies | |

| Task | SOL Correlations |
|---|--|
| Demonstrate big-picture thinking. | English: 6.1, 6.4, 7.1, 7.4, 8.1, 8.4, 9.1, 9.5, 10.1, 10.5, 11.1, 11.5, 12.1, 12.5 History and Social Science: CE.1, CE.4, CE.12, GOVT.1, GOVT.15, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 |
| Demonstrate career- and life-management skills. | English: 6.1, 6.7, 7.1, 7.7, 8.1, 8.7, 9.1, 9.6, 10.1, 10.6, 11.1, 11.6, 12.1, 12.6 History and Social Science: CE.1, CE.4, CE.12, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 8.4 |
| Demonstrate continuous learning and adaptability. | English: 6.1, 6.4, 6.7, 6.9, 7.1, 7.4, 7.7, 7.9, 8.1, 8.4, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.3, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: BIO.1, CH.1, LS.1, PH.1, PH.4, PS.1 |
| Manage time and resources. | English: 6.1, 6.2, 6.4, 6.7, 6.9, 7.1, 7.2, 7.4, 7.7, 7.9, 8.1, 8.2, 8.4, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.2, 11.5, 11.6, 11.8, 12.2, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.10, 6.11, 6.12, 7.2, 7.3, 7.8, 7.9, 7.10, 7.11, 7.12, 7.13, 8.4, 8.11, 8.12, 8.13, 8.14, 8.17, 8.18, A.4, A.5, A.8, A.9, AFDA.3, AFDA.4, AFDA.5, AFDA.6, AFDA.7, AFDA.8, COM.1, COM.3, COM.5, COM.8 |
| Demonstrate information-literacy skills. | English: 6.1, 6.2, 6.4, 6.6, 6.7, 6.9, 7.1, 7.2, 7.3, 7.4, 7.6, 7.7, 7.9, 8.1, 8.2, 8.3, 8.4, 8.6, 8.7, 8.9, 9.2, 9.5, 9.6, 9.8, 10.2, 10.5, 10.6, 10.8, 11.2, 11.5, 11.6, 11.8, 12.2, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.10, 6.11, 7.8, 7.9, 8.11, 8.12, A.8, A.9, AFDA.3, AFDA.4, AFDA.6, AFDA.7, AFDA.8, DM.8, PS.1*, PS.2*, PS.3*, PS.4*, PS.7*, PS.8*, PS.9*, PS.10* Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PH.1, PS.1 |

| Task | SOL Correlations |
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| Demonstrate an understanding of information security. | English: 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 7.1, 7.2, 7.3, 7.4, 7.6, 7.7, 7.8, 7.9, 8.1, 8.2, 8.3, 8.4, 8.6, 8.7, 8.8, 8.9, 9.1, 9.2, 9.5, 9.6, 9.8, 10.1, 10.2, 10.5, 10.6, 10.8, 11.1, 11.2, 11.5, 11.6, 11.8, 12.1, 12.2, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: COM.10 |
| Maintain working knowledge of current information-technology (IT) systems. | English: 6.1, 6.3, 6.4, 6.6, 6.9, 7.1, 7.3, 7.4, 7.6, 7.9, 8.1, 8.3, 8.4, 8.6, 8.9 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 7.8, COM.1, COM.2, COM.7, COM.9, COM.10, COM.11, COM.16, COM.18, PS.17 Science: BIO.1, CH.1, ES.1, PH.1 |
| Demonstrate proficiency with technologies, tools, and machines common to a specific occupation. | History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.10, 6.11, 7.9, 8.4, A.7, A.8, A.9, AFDA.1, AFDA.3, AFDA.5, AII.4, AII.7, AII.9, COM.1, COM.7, COM.10, COM.11, COM.12, COM.16 Science: CH.1, ES.1, LS.1, PH.1, PS.1 |
| Apply mathematical skills to job-specific tasks. | English: 6.4, 6.6, 6.7, 7.4, 7.6, 7.7, 8.4, 8.6, 8.7, 9.5, 9.6, 10.5, 10.6, 11.5, 11.6, 12.5, 12.6 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.1, 6.2, 6.5, 6.6, 6.12, 6.13, 6.14, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.8, 7.9, 7.11, 7.12, 7.13, 8.4, 8.5, 8.6, 8.8, 8.9, 8.10, 8.11, 8.12, 8.13, 8.14, 8.15, 8.16, 8.17, 8.18, A.1, A.3, A.4, A.5, A.7, A.8, A.9, AFDA.1, AFDA.3, AFDA.5, AFDA.8, AII.3, AII.7, AII.9, AII.10, COM.1, COM.7 Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PH.1, PS.1 |
| Demonstrate professionalism. | English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 |

| Task | SOL Correlations |
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| Demonstrate reading and writing skills. | English: 6.1, 6.6, 6.7, 7.1, 7.6, 7.7, 8.1, 8.6, 8.7, 9.1, 9.5, 9.6, 9.7, 10.1, 10.5, 10.6, 10.7, 11.1, 11.5, 11.6, 11.7, 12.1, 12.5, 12.6, 12.7 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: 6.1, PH.1, PS.1 |
| Demonstrate workplace safety. | English: 6.4, 7.4, 8.4, 9.5, 10.5, 11.5, 12.5 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: CH.1 |
| Examining All Aspects of an Industry | |
| Examine aspects of planning within an industry/organization. | History and Social Science: GOVT.16 |
| Examine aspects of management within an industry/organization. | |
| Examine aspects of financial responsibility within an industry/organization. | |
| Examine technical and production skills required of workers within an industry/organization. | |
| Examine principles of technology that underlie an industry/organization. | |
| Examine labor issues related to an industry/organization. | History and Social Science: GOVT.16 |
| Examine community issues related to an industry/organization. | History and Social Science: GOVT.16 |
| Examine health, safety, and environmental issues related to an industry/organization. | History and Social Science: GOVT.16 |
| Addressing Elements of Student Life | |

| Task | SOL Correlations |
|---|--|
| Identify the purposes and goals of the student organization. | |
| Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult. | |
| Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects. | |
| Identify Internet safety issues and procedures for complying with acceptable use standards. | |
| Exploring Work-based Learning | |
| Identify the types of work-based learning (WBL) opportunities. | |
| Reflect on lessons learned during the WBL experience. | |
| Explore career opportunities related to the WBL experience. | |
| Participate in a WBL experience, when appropriate. | |
| Applying Basic Safety Standards for Mechatronics | |
| Comply with federal, state, and local safety requirements. | English: 11.5, 12.5 Science: CH.1 History and Social Sciences: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Demonstrate lockout-tagout procedures. | English: 11.5, 12.5 |

| Task | SOL Correlations |
|---|---|
| | History and Social Sciences: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Maintain a safe working environment. | English: 11.5, 12.5 History and Social Studies: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Explain safe working practices around electrical hazards. | English: 11.5, 11.6, 11.7, 12.5, 12.6, 12.7 WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Identify emergency first-aid procedures. | English: 11.5, 12.5 History and Social Sciences: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Identify the types of fires and the methods used to extinguish them. | English: 11.5, 12.5 Science: CH.1 History and Social Sciences: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Demonstrate the use of a fire extinguisher. | English: 11.5, 12.5 Science: CH.1 History and Social Sciences: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Identify personal protective equipment (PPE) requirements. | English: 11.5, 12.5 History and Social Sciences: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Inspect hand and power tools to ensure safety and usability. | English: 11.5, 12.5 History and Social Science: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Demonstrate lifting and carrying techniques. | History and Social Sciences: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Report injuries. | English: 11.5, 11.6, 11.7, 12.5, 12.6, 12.7 History and Social Sciences: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Report personal, environmental, and equipment safety violations to the appropriate authority. | English: 11.5, 11.6, 11.7, 12.5, 12.6, 12.7 |

| Task | SOL Correlations |
|---|---|
| | History and Social Sciences: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Pass the safety exam. | English: 11.5, 12.5 History and Social Sciences: WHII 8, 14; VUS 8, 14; Govt 7, 8, 9 |
| Understanding Electrical Components in a Mechatronic System | |
| Trace the flow of electrical and mechanical energy in a mechatronic system. | Science: PH.7 |
| Explain the specific roles of electrical components within a typical circuit schematic. | English: 11.5, 12.5 Science: PH.11 |
| Compute wire and fuse sizes based on the load required by the motor. | |
| Analyze basic direct current (DC) circuits to predict and verify circuit behavior. | English: 11.5, 12.5 Mathematics: AII.3 Science: PH.11 |
| Analyze circuits to predict and verify the behavior of series circuits vs. parallel DC circuits or resistances. | English: 11.5, 12.5 Science: PH.11 |
| Explain the physical operation of electromagnetic components in a mechatronic system. | English: 11.5, 12.5 Science: PH.7 |
| Evaluate circuits to predict and verify the behavior of the electrical and physical properties of components. | English: 11.5, 12.5 Science: PH.11 |
| Understanding Mechanical Components in a Mechatronic System | |
| Explain the role of various mechanical components within a given system or module. | English: 11.5, 12.5 |
| Describe the basic physical properties of mechanical components. | English: 11.5, 12.5 |

| Task | SOL Correlations |
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| Identify mechanical components of systems prescribed by drawings. | |
| Calculate gear ratios and horsepower. | |
| Distinguish between various AC motors and DC motors. | English: 11.5, 12.5 Science: PH.11 |
| Describe power transmission components. | English: 11.5, 12.5 |
| Maintain a mechatronic system. | English: 11.5, 11.6, 11.7, 12.5, 12.6, 12.7 |
| Assemble the mechanical components in a mechatronic system. | |
| Understanding Fluid Power (Hydraulics and Pneumatics) | |
| Demonstrate fluid-power system safety. | English: 11.5, 12.5 |
| Explain the principles of fluid power. | English: 11.5, 12.5 |
| Differentiate between hydraulic and pneumatic fluid power. | English: 11.5, 12.5 |
| Identify fluid power components. | |
| Read fluid power circuit diagrams. | English: 11.5, 12.5 |
| Explain fluid-power systems. | English: 11.5, 12.5 |
| Identify types of fluid power pumps or compressors. | English: 11.5, 12.5 |
| Identify types of fluid power actuators. | |
| Examine the physical characteristics and compressibility of gases. | English: 11.5, 12.5 Mathematics: AII.3, AII.10 |
| Describe the flow of energy in a fluid system. | English: 11.5, 12.5 |
| Construct fluid-power systems from components and symbols. | English: 11.5, 12.5 |
| Explain fluid-power system maintenance. | English: 11.5, 12.5 |
| Exploring Computer Applications | |
| Demonstrate a working knowledge of the personal computer (PC). | English: 11.5, 12.5 |

| Task | SOL Correlations |
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| | Mathematics: COM.1 |
| Discuss software and hardware. | English: 11.5, 12.5 Mathematics: COM.16 |
| Explain the function of the Internet and manufacturing networks. | English: 11.5, 12.5 |
| Exploring Digital Circuit Fundamentals | |
| Describe logic gates. | English: 11.5, 12.5 Mathematics: COM.8 |
| Examine simple logic circuits using a variety of logic gates. | English: 11.5, 12.5 |
| Using Technical Documents | |
| Consult technical documents to assess a mechatronic system and troubleshoot malfunctions in electrical components. | English: 11.5, 12.5 |
| Verify the parts, relationships, and behavior depicted by the technical data sheets for components within a mechatronic system. | English: 11.5, 12.5 |
| Create a document describing the operation of a mechatronic system. | English: 11.5, 12.5 |