

Standards Correlations

Engineering Concepts and Processes III

8452 36 weeks

Task	SOL Correlations	ITEEA Correlations	TSA 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,		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	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 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		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
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			
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		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	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		
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,		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	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		
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.			

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
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			
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.			

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Explore career opportunities related to the WBL experience.			
Participate in a WBL experience, when appropriate.			
Functioning as a Team on an Engineering Project			
Explain the purpose and functions of a project team.	English: 11.5, 12.5	<p>1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system</p> <p>2Z. Use management processes in planning, organizing, and controlling work</p> <p>8P. Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality.</p>	
Explain the benefits of multiple perspectives and diverse skills in solving practical engineering problems.	<p>English: 11.5, 12.5</p> <p>History and Social Sciences: GOVT.16</p>	<p>1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system</p> <p>2Z. Use management processes in planning, organizing, and controlling work</p> <p>8P. Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality.</p>	<p>Engineering Design</p> <p>Manufacturing Prototype</p>

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Describe the organization of a team for an engineering project.	English: 11.5, 12.5	1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system 2Z. Use management processes in planning, organizing, and controlling work 8P. Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality.	Engineering Design Manufacturing Prototype
Identify the steps in a team's life cycle.	English: 11.5, 12.5	1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system 2Z. Use management processes in planning, organizing, and controlling work 8P. Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality.	Engineering Design
Deliver constructive feedback.	English: 11.1, 12.1 History and Social Sciences: GOVT.16	3I. Evaluate how technology enhances opportunities for new products and services through globalization.	

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
		4P. Evaluate ways that technology can impact individuals, society, and the environment.	
Interpret constructive feedback.	English: 11.5, 12.5	3J. Connect technological progress and to the advancement of other areas of knowledge, and vice versa.	
Explain the importance of generating consensus for the project idea to team members.	English: 11.5, 12.5 History and Social Sciences: GOVT. 3,16		
Describe conflict resolution techniques within a team.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT. 1,16		Technology Bowl
Identify active-listening techniques.	English: 11.1, 12.1		
Explain the benefits of active listening.	English: 11.5, 12.5		
Demonstrate formal and informal professional communication.	English: 11.1, 12.1		Extemporaneous Speech
Perform self-evaluations and a team peer review.			
Identify ways to motivate individuals and teams.	English: 11.5, 12.5		
Demonstrate the ability to work with a team on an engineering design project.	English: 11.1, 12.1 History and Social Sciences: GOVT. 16	1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system	Engineering Design CAD Engineering Manufacturing Prototype

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
		2Z. Use management processes in planning, organizing, and controlling work 8P. Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality.	Biotechnology Design
Applying Project Management Skills to an Engineering Design Project			
Identify an engineering problem.	English: 11.5, 12.5	1N. Explain how the world around them guides technological development and engineering design 2X. Cite examples of the criteria and constraints of a product or system and how they affect final design.	Engineering Design
Create a proposal for an engineering project.	English: 11.1, 12.1 History and Social Sciences: VUS.1, GOVT. 1	8N. Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design
Outline a project life cycle.	English: 11.6, 11.7, 12.6, 12.7	4Q. Critique whether existing and proposed technologies use resources sustainably. 4S. Develop a solution to a technological problem that has the least negative environmental and social impact.	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Identify the components of a goal.	English: 11.5, 12.5	4R. Assess a technology that minimizes resource use and resulting waste to achieve a goal.	
Assess the available resources for a project.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT. 1	2W. Select resources that involve tradeoffs between competing values, such as availability, cost, desirability, and waste while solving problems. 4Q. Critique whether existing and proposed technologies use resources sustainably.	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design
Allocate resources.	English: 11.5, 12.5	2W. Select resources that involve tradeoffs between competing values, such as availability, cost, desirability, and waste while solving problems.	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design
Apply project management tools.	English: 11.5, 12.5	2Z. Use management processes in planning, organizing, and controlling work.	
Prioritize the procedures to complete a project.	English: 11.5, 12.5	2Z. Use management processes in planning, organizing, and controlling work.	Engineering Design
Assign tasks to team members.	English: 11.5, 12.5	2Z. Use management processes in planning, organizing, and controlling work.	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Track progress.	English: 11.5, 12.5	2Z. Use management processes in planning, organizing, and controlling work.	Engineering Design
Analyze results.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT. 1	2Z. Use management processes in planning, organizing, and controlling work.	Engineering Design
Create a technical report on an engineering project.	English: 11.1, 11.5, 11.8, 12.1, 12.5, 12.8	2Z. Use management processes in planning, organizing, and controlling work.	Engineering Design
Create a multimedia presentation of a finished proposal.	English: 11.1, 11.2, 12.1, 12.2 History and Social Sciences: VUS.1, GOVT. 1	2Z. Use management processes in planning, organizing, and controlling work.	Promotional Marketing
Identifying Product and Process Trends			
Identify the stages of a product life cycle.	English: 11.5, 12.5	4Q. Critique whether existing and proposed technologies use resources sustainably. 4S. Develop a solution to a technological problem that has the least negative environmental and social impact.	Manufacturing Prototype
Assess the costs of product and system life cycles.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT. 1	4Q. Critique whether existing and proposed technologies use resources sustainably. 4S. Develop a solution to a technological problem that has the least	Geospatial Technology

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
		negative environmental and social impact.	
Assess a new product or system currently entering the market.	English: 11.5, 11.8, 12.5, 12.8 History and Social Sciences: VUS.1, GOVT. 1	8O. Develop a device or system for the marketplace.	Promotional Marketing
Describe the factors necessary for changes in technology.	English: 11.5, 12.5	6J. Investigate the widespread changes that have resulted from the Information Age, which has placed emphasis on the processing and exchange of information.	Geospatial Technology
Define <i>forecasting</i> .	English: 11.3, 11.5, 12.3, 12.5	2V. Analyze the stability of a technological system and how it is influenced by all of the components in the system, especially those in the feedback loop.	Geospatial Technology
Research current technological trends.	English: 11.5, 11.8, 12.5, 12.8 History and Social Sciences: VUS.1, GOVT. 1	2V. Analyze the stability of a technological system and how it is influenced by all of the components in the system, especially those in the feedback loop. 3I. Evaluate how technology enhances opportunities for new products and services through globalization.	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design Transportation Modeling
Explain the objectives and importance of a feasibility study.	English: 11.5, 12.5	4P. Evaluate ways that technology can impact individuals, society, and the environment.	Engineering Design
Exploring Engineering Ethics			

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Compare professional and personal ethics.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT. 1	6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history.	
Identify ethical theories.	English: 11.5, 12.5 History and Social Sciences: VUS.4-5, GOVT. 2-4,11,16	6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history.	
Research a real-world case study.	English: 11.5, 11.8, 12.5, 12.8 History and Social Sciences: VUS.1, GOVT. 1	4P. Evaluate ways that technology can impact individuals, society, and the environment.	STEM Careers (Virginia TSA only)