

Standards Correlations

Engineering Practicum IV

8453 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		

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	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 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		

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	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			
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		

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	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,		

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	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		

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	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		
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		

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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			
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.			

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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.			
Examining Employability Skills			
Research a principal field of interest in engineering.	English: 11.5, 11.8, 12.5, 12.8 History and Social Sciences: VUS.1, GOVT.1	5H. Evaluate a technological innovation that arose from a specific society's unique need or want 6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history	STEM Careers (Virginia TSA only)
Identify educational requirements for the chosen field.	English: 11.5, 12.5	5H. Evaluate a technological innovation that arose from a specific society's unique need or want	STEM Careers (Virginia TSA only)

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
		6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history	
Research postsecondary education opportunities.	English: 11.5, 11.8, 12.5, 12.8 History and Social Sciences: VUS.1, GOVT.1	5H. Evaluate a technological innovation that arose from a specific society’s unique need or want 6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history	STEM Careers (Virginia TSA only)
Compare requirements for select professional certifications and licensure.	English: 11.5, 11.8, 12.5, 12.8 History and Social Sciences: VUS.1, GOVT.1	5H. Evaluate a technological innovation that arose from a specific society’s unique need or want 6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history	
Build a complete work portfolio.	English: 11.1, 11.6, 11.7, 12.1, 12.6, 12.7 History and Social Sciences: VUS.1, GOVT.1	7X. Document trade-offs in the technology and engineering design process to produce the optimal design	STEM Careers (Virginia TSA only)
Identify the process of applying for an engineering internship or job.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT.1	1Q. Conduct research to inform intentional inventions and innovations that address specific needs and wants.	STEM Careers (Virginia TSA only)

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
		6H. Evaluate how technology has been a powerful force in reshaping the social, cultural, political, and economic landscapes throughout history	
Analyze the similarities and differences between the engineering design process and the scientific method.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT.1	1R. Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system.	Engineering Design
Examining Intellectual Property			
Explain how ethical behavior of engineers is essential to the betterment of society.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT.1, 16	2U. Diagnose a flawed system embedded within a larger technological, social, or environmental system.	
Identify types of intellectual property rights and how they are protected and enforced.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT.1	2Z. Use management processes in planning, organizing, and controlling work 8N. Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.	Engineering Design
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.	
Designing a Practicum Project			

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
Identify the need or opportunity for an engineering solution.	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 7W. Determine the best approach by evaluating the purpose of the design 7Y. Optimize a design by addressing desired qualities within criteria and constraints 7AA. Illustrate principles, elements, and factors of design.	Engineering Design Geospatial Technology
Use systems thinking in an engineering design process.	English: 11.5, 12.5	2Z. Use management processes in planning, organizing, and controlling work.	Engineering Design
Evaluate the safety of designs.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT.1	8P. Apply appropriate methods to diagnose, adjust and repair systems to ensure precise, safe and proper functionality.	
Present a proposal to an engineering challenge.	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.	Engineering Design CAD Engineering Manufacturing Prototype Biotechnology Design
Peer review all proposals.	English: 11.1, 12.1	5H. Evaluate a technological innovation that arose from a specific society's unique need or want. 5I. Evaluate a technological innovation that was met with societal resistance impacting its development.	
Use the engineering design process to complete the practicum project.	English: 11.5, 11.8, 12.5, 12.8	2Z. Use management processes in planning,	Engineering Design

Task	SOL Correlations	ITEEA Correlations	TSA Correlations
	History and Social Sciences: VUS.1, GOVT.1		CAD Engineering Manufacturing Prototype Biotechnology Design
Develop a schedule using industry-standard applications to ensure the solution can be completed during the course.	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. 2Y. Implement quality control as a planned process to ensure that a product, service, or system meets established criteria. 2Z. Use management processes in planning, organizing, and controlling work.	Engineering Design
Research cost-estimation tools and methods in the engineering field.	English: 11.5, 11.8, 12.5, 12.8 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.	
Use engineering project management tools.	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. 2Y. Implement quality control as a planned process to ensure that a product, service, or system meets established criteria. 2Z. Use management processes in planning, organizing, and controlling work.	
Develop a budget.	English: 11.1, 11.2, 12.1, 12.2	2W. Select resources that involve tradeoffs between competing values, such as availability,	

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		cost, desirability, and waste while solving problems.	
Create a work schedule.	English: 11.1, 12.1	2W. Select resources that involve tradeoffs between competing values, such as availability, cost, desirability, and waste while solving problems.	Plan of Work log in Virginia TSA events.
Document the progression of the engineering practicum in a technical report.	English: 11.6, 11.7, 12.6, 12.7	7X. Document tradeoffs in the technology and engineering design process to produce the optimal design. 7AA. Illustrate principles, elements, and factors of design.	Engineering Design Manufacturing Prototype Biotechnology Design
Apply model and simulation techniques to create a model.	English: 11.5, 12.5	2T. Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making.	Engineering Design CAD Engineering Manufacturing Prototype Transportation Modeling
Analyze the potential risk list.	English: 11.5, 12.5 History and Social Sciences: VUS.1, GOVT.1	8Q. Synthesize data and analyze trends to make decisions about technological products, systems, or processes. 8R. Interpret the results of technology assessment to guide policy development.	
Communicate the solution to stakeholders.	English: 11.5, 12.5	8N. Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.	Extemporaneous Speech Prepared Presentation Interviews in Virginia TSA events Manufacturing Prototype

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Present the final project.	English: 11.1, 11.2, 12.1,12.2 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 Transportation Modeling
Participate in a mock interview, preferably with professionals in the industry.	English: 11.1, 12.1 History and Social Sciences: VUS.1, GOVT.1, 16	4Q. Critique whether existing or proposed technologies use resources sustainably 8N. Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.	STEM Careers (Virginia TSA only)
Exhibit technical and life skills necessary for success in the engineering field.	English: 11.1, 11.5, 11.6, 11.7, 12.1, 12.5, 12.6, 12.7 History and Social Sciences: VUS.1, GOVT.1 Mathematics: DS.1*, DS.2, DS.4, DS.5*, DS.6*, DS.9, DS.10, DS.11*, DS.12*, DS.13*	1O. Assess how similarities and differences among scientific, mathematics, engineering, and technological knowledge and skills contributed to the design of a product or system.	