



CTSO Course Alignments: Engineering Practicum

Below you will find standards for the Engineering Practicum course aligned with competitive events from appropriate career and technical student organizations (CTSOs). Knowing the aligned events for your organization will allow you to have additional tools for teaching course standards, as well as increase student engagement and preparation in your CTSO activities. The final column recommends potential tools from other CTSO organizations. Even if your students are not participating in these organizations, available rubrics, tools, and materials can also add to the instructional resources at your disposal for best teaching your content.

Important to note: While the aligned activities below can be important tools in teaching course standards, it is important to note that events may not cover a standard in its entirety and should not be the sole instructional strategy used to address a standard.

	STANDARD	ALIGNED TSA COMPETITIVE EVENTS/PROGRAMS	OTHER POTENTIAL CTSO TOOLS & RESOURCES
1	Accurately read and interpret safety rules, including but not limited to rules published by the National Science Teachers Association (NSTA), rules pertaining to electrical safety, Occupational Safety and Health Administration (OSHA) guidelines, and state and national code requirements. Be able to distinguish between the rules and explain why certain rules apply. (TN Reading 3, 4, 6)		<ul style="list-style-type: none"> • FFA: Agricultural Mechanics and Technology • SkillsUSA: Occupational Health and Safety
2	Identify and explain the intended use of safety equipment available in the classroom. For example, demonstrate how to properly inspect, use, and maintain safe operating procedures with tools and equipment. Incorporate safety procedures and complete safety test with 100 percent accuracy. (TN Reading 3, 4)		<ul style="list-style-type: none"> • FFA: Agricultural Mechanics and Technology • SkillsUSA: Occupational Health and Safety
3	Develop an informational annotated document, linked to bookmarked websites, illustrating the opportunities for students to investigate and experience engineering and technology while in school, focusing specifically on those programs offered by colleges and universities in Tennessee. For example, opportunities include job shadowing, internships, co-op programs, volunteer and community service, and part-time employment. (TN Reading 5, 7, 9; TN Writing 2, 4, 6, 8)	<ul style="list-style-type: none"> • TSA: Desktop Publishing 	

4	<p>Research and select a company or organization for a work-based learning project in an engineering or technology area of choice. Cite specific textual evidence from the organization’s literature, as well as independent news articles to summarize:</p> <ol style="list-style-type: none"> The mission and history of the organization Headquarters and organizational structure Products or services provided Credentials required for employment and how they are obtained and maintained Policies and procedures Reports, newsletters, and other documents published by the organization Website and contact information <p>(TN Writing 4, 7)</p>		<ul style="list-style-type: none"> • SkillsUSA: Job Interview, Employment Application Process, Entrepreneurship • FCCLA: Job Interview, Career Investigation, Entrepreneurship, Interpersonal Communications
5	<p>Search for the resumes of engineers and technologists retrieved from the websites of institutions, organizations, or professional networks. Discuss what is typically included in the resumes of engineering and technology professionals, compare and contrast several examples, and create a personal resume modeled after elements identified in the search. (TN Reading 1, 4, 5, 6; TN Writing 4)</p>		<ul style="list-style-type: none"> • FBLA: Job Interview • FCCLA: Job Interview, Career Investigation, Entrepreneurship, Interpersonal Communications • SkillsUSA: Job Interview, Employment Application Process, Entrepreneurship
6	<p>Conduct a job search and simulate the experience by researching local employment options. In preparation for a future career in engineering or technology, complete an authentic job application form and compose a cover letter following guidelines specified in the vacancy announcement. (TN Reading 7; TN Writing 4)</p>		<ul style="list-style-type: none"> • FBLA: Job Interview • FCCLA: Job Interview, Career Investigation, Entrepreneurship, Interpersonal Communications • SkillsUSA: Job Interview, Employment Application Process, Entrepreneurship
7	<p>Participate in a mock interview. Prior to the interview, prepare a paper that includes the following: tips on dress and grooming, most commonly asked interview questions, appropriate conduct during an interview, and recommended follow-up procedures. Upon completion of the interview, write a thank you letter to the interviewer in a written or email format. (TN Reading 2; TN Writing 2, 4, 7, 9)</p>		<ul style="list-style-type: none"> • FBLA: Job Interview • FCCLA: Job Interview, Career Investigation, Entrepreneurship, Interpersonal Communications • FFA: Job Interview • SkillsUSA: Job Interview, Employment Application Process, Entrepreneurship
8	<p>Apply skills and knowledge from previous courses in an authentic work-based learning internship, job shadow, or classroom-based project. Where appropriate, develop, practice, and demonstrate skills outlined in previous courses. (TN Reading 2, 3)</p>		<ul style="list-style-type: none"> • FCCLA: Job Interview, Career Investigation, Entrepreneurship, Interpersonal Communications • SkillsUSA: Job Interview, Employment Application Process, Entrepreneurship

9	<p>Identify a problem faced by a local organization or company to define a project proposal. Incorporate organization or company interviews into the research, as well as engineering concepts from the prior three courses. Prepare a written project proposal including the problem definition; justification for why the problem is important to solve; design statement; criteria; constraints; information obtained through research; and deliverables. (TN Reading 3, 4, 7, 9; TN Writing 1, 5, 7)</p>	<ul style="list-style-type: none"> • TSA: Engineering Design, Manufacturing Prototype 	<ul style="list-style-type: none"> • FBLA: American Enterprise Project, Partnership with Business Project • FCCLA: Advocacy • DECA: Business Operations Research Events
10	<p>Create and continually update a personal journal to document skills learned during the practicum and draw connections between the experience and previous course content by reflecting on:</p> <ol style="list-style-type: none"> Tasks accomplished and activities implemented Positive and negative aspects of the experience How challenges were addressed Team participation in a learning environment Comparisons and contrasts between classroom and work environments Interactions with colleagues and supervisors Personal career development Personal satisfaction <p>(TN Writing 2, 4)</p>		<ul style="list-style-type: none"> • FCCLA: Job Interview, Career Investigation, Entrepreneurship, Interpersonal Communications • SkillsUSA: Job Interview, Employment Application Process, Entrepreneurship
11	<p>Create a portfolio, or similar collection of work, that illustrates mastery of skills and knowledge outlined in the previous courses and applied in the practicum. The portfolio should reflect thoughtful assessment and evaluation of the progression of work involving the application of steps of the engineering design process (depending on the nature of the work-based learning project). The following documents will reside in the career portfolio:</p> <ol style="list-style-type: none"> Career and professional development plan Resume List of responsibilities undertaken through the course Examples of visual materials developed and used during the course (such as graphics, drawings, models, presentation slides, videos, and demonstrations) Description of technology used, with examples if appropriate Periodic journal entries reflecting on tasks and activities Feedback from instructor and/or supervisor based on observations <p>(TN Writing 4, 5)</p>	<ul style="list-style-type: none"> • TSA: Desktop Publishing 	<ul style="list-style-type: none"> • FCCLA: Job Interview, Career Investigation, Entrepreneurship, Interpersonal Communications • FFA: Job Interview • SkillsUSA: Job Interview, Employment Application Process, Entrepreneurship
12	<p>Apply all steps of the engineering design process to successfully generate a prototype, collect the relevant data, perform the necessary tests, interpret the results, make modifications to models or prototypes, and communicate results over the course of the project's duration. Produce a technical report documenting the findings of the project and justifying the final conclusions based on evidence obtained. (TN Reading 1, 2, 3, 4, 5, 7, 8, 9; TN Writing 1, 2, 4, 5, 6, 7, 8, 9)</p>	<ul style="list-style-type: none"> • TSA: CNC Production, Engineering Design, Manufacturing Prototype 	<ul style="list-style-type: none"> • HOSA: Researched Persuasive Speaking

13	<p>Upon completion of the practicum, develop a technology-enhanced presentation showcasing highlights, challenges, and lessons learned from the experience. The presentation should be delivered orally, but supported by relevant graphic illustrations, such as diagrams, drawings, and models of project findings, and/or physical artifacts that represent the outcome of the project (i.e., a prototype or 3-D model). Prepare the presentation in a format that could be presented to both a technical and a non-technical audience, as well as for a career and technical student organization (CTSO) competitive event. (TN Reading 1, 3, 7, 9; TN Writing 2, 4, 5, 6, 9)</p>	<ul style="list-style-type: none"> • TSA: Engineering Design, CNC Production, Desktop Publishing, Prepared Presentation, Manufacturing Prototype 	<ul style="list-style-type: none"> • FBLA: Electronic Career Portfolio • HOSA: Prepared Speaking
ALL	<p>CAN BE USED WITH ALL/MOST STANDARDS</p>	<ul style="list-style-type: none"> • TSA: Career Preparation 	<ul style="list-style-type: none"> • FCCLA: Illustrated Talk, Career Investigation, Chapter in Review Display, Chapter in Review Portfolio, • HOSA: Job Seeking Skills • SkillsUSA: Career Pathways Showcase, Job Skills Demonstration A, Job Skills Demonstration O, Prepared Speech, Extemporaneous Speaking, Chapter Display, Principles of Engineering Technology, Engineering Technology/Design