Engineering Technology Blueprint

This Blueprint contains the subject matter content of this Career Essentials Assessment.

**Note:** To fully prepare for Engineering Technology SkillsUSA Championships contest, refer to the current year’s SkillsUSA Championships Technical Standard, now included with your SkillsUSA Professional Membership. If you need help in accessing this benefit, contact the SkillsUSA Membership Office at 1-800-355-8422.

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**Standards and Competencies**

Competencies are weighted throughout the assessment. The percent shown is the weight of the competency. There are 50 questions per assessment.

**Integrate knowledge of basic engineering principles into technical writing and presentations following the guidelines the contest technical committee has established**

- Apply engineering knowledge in the areas of force, work, rate, resistance, energy, power, force transformers, momentum, waves and vibrations, energy converters, transducers, radiation, optical systems

**Transform existing systems into conceptual models**

- Transform conceptual models into determinable models
- Use determinable models to obtain system specifications
- Select optimum specifications and create physical models
- Apply the results from physical models to create real target systems
- Critically review real target systems and personal performance
- Design effective and usable IT-based solutions and integrate them into the user environment
- Assist in the creation of an effective project plan
- Identify and evaluate current and emerging technologies and assess their applicability to address the users’ needs

**Showcase knowledge of project planning**

- Apply brainstorming techniques
- Implement benchmarking
- Discuss continuous improvement
- Explain cause and effect relationships
- Apply knowledge of customer satisfaction
- Demonstrate how to collect data
- Apply decision making skills
- Define and describe a process
- Empower team members
- Recognize methods of idea generation
- Prioritize tasks
- Reach consensus amongst the team
- Display teamwork during the contest
- Have equal team participation
- Show positive group dynamics
- Define team roles
Developing/identifying opportunities
• Identify and define the opportunity
• Identify the customer
• Identify the customer’s needs
• State the problem or areas of improvement within the identified opportunity clearly and concisely
• Quantify the opportunity with data
• Show data gathered from research
• Identify opportunity for improvement
• Make decisions based on facts, not opinions
• Show how the team determined the cause(s) of the problem and gained an understanding of the variation that occurs in the process
• Diagram and perform a thorough assessment of the possible causes
• Develop various solutions
• Show alternative approaches or changes that would improve the situation
• Show the analysis used to select the most beneficial solution to implement
• Define milestones
• Recommend a plan to implement the solution(s)
• Use analytical decision making by making full use of flow charts, bar graphs, cause and effect diagrams, Pareto diagrams, etc.
• Describe a method to standardize or institutionalize the process

Write a problem statement
• Define the problem
• Define the customer
• Explain the customer expectations
• Describe the product or service
• Discuss how the product or service fulfills the customer’s expectations
• List the needed data
• Reflect on how the process can be improved
  o Describe how the improved process will meet or exceed the customer’s expectations

Design and deliver a presentation that discusses the problems and processes of the local institution
• Make the presentation clear and concise
• Use graphics effectively to clarify presentation topics
• Use time wisely while presenting

Design and develop a presentation that is the result of findings from the on-site problem and process
• Make the presentation clear and concise
• Use graphics effectively to clarify presentation topics
• Use time wisely while presenting
Deliver the presentation in a professional manner, meeting the standards outlined by the technical committee

- Explain the topic through the use of displays or practical operations
- Demonstrate an effective and pleasing delivery style
- Use verbal illustrations and examples effectively
- Make a formal and effective introduction to the presentation that clearly identifies the scope of the presentation
- Pronounce words in a clear and understandable manner
- Use a variety of verbal techniques including: modulation of voice, changing volume, varied inflection, modifying tempo and verbal enthusiasm
- Demonstrate poise and self-control while presenting
- Demonstrate good platform development and personal confidence
- Communicate the primary points of the speech in a compact and complete manner
- Tie organizational elements together with an effective ending
- Complete the speech within the time limits set by contest requirements
- Develop storyboards for the presentation outlining the process