

KPBSD Principles of Engineering Curriculum – 2017

| Industry Standards | | |
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| <p>PROJECT LEAD THE WAY STANDARDS</p> <ol style="list-style-type: none"> 1. Demonstrate an ability to identify, formulate, and solve engineering problems. 2. Demonstrate an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health, and safety, manufacturability, and sustainability. 3. Demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data. 4. Demonstrate an ability to apply knowledge of mathematics, science, and engineering. 5. Demonstrate an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. 6. Pursue the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context. 7. Demonstrate an understanding of professional and ethical responsibility. 8. Demonstrate an ability to function on multidisciplinary teams. 9. Demonstrate an ability to communicate effectively. 10. Gain knowledge of contemporary issues. 11. Recognize the need for, and develop an ability to engage in lifelong learning. | Transfer Goals | |
| | <p>Students will be able to independently use their learning to...</p> <ul style="list-style-type: none"> • Explore career opportunities in engineering to gain insight related to the pathway to engineering, the current state of engineering, and contemporary issues. • Apply the engineering design process to identify, formulate, and solve engineering problems within realistic constraints. • Function on multidisciplinary teams and communicate effectively. | |
| | Meaning | |
| | <p style="text-align: center;">ENDURING UNDERSTANDINGS</p> <p>Students will understand...</p> <ul style="list-style-type: none"> • Engineers apply math, science, and discipline-specific skills to solve contemporary problems. • Effective presentations are the result of preparation, and are tailored to suit the purpose and audience. • Each team member’s voice is important and their contribution is valuable toward the final product. • Engineers have a professional and ethical responsibility to life and the planet. | <p style="text-align: center;">ESSENTIAL QUESTIONS</p> <p>Students will keep considering...</p> <ul style="list-style-type: none"> • What are some different types of occupations within the engineering pathway? • How do engineers apply math, science, and discipline-specific skills to solve contemporary problems? • How do engineers prepare an effective presentation? • Why is everyone’s voice and contributions important and valuable, including my own? • How could designing a solution to a problem without regard to professional and ethical responsibility be problematic? |
| | Acquisition | |
| <p>Students will know...</p> <p>The engineering design process as it relates to:</p> <ul style="list-style-type: none"> • Energy and Power. • Materials and Structures. • Control Systems. • Statics and Kinematics. | <p>Students will be skilled at...</p> <ul style="list-style-type: none"> • Solving various engineering problems using the engineering design process. • Using the proper equations effectively and calculating accurately. | |

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| ALASKA STANDARDS ALIGNMENT: Principles of Engineering | <ul style="list-style-type: none">• The equations used for solving various engineering problems.• The proper tools and materials for a given situation.• The etiquette and cultural norms for effectively working on a team.• The responsibilities of various types of engineers.• The contemporary issues facing engineers today. | <ul style="list-style-type: none">• Correctly using related tools like computer software, building kits, gear trains, pulley systems, etc.• Determining the mechanical advantage and efficiency of a system.• Designing and constructing solutions to engineering design problems.• Collaborating effectively with others in a design team.• Preparing and delivering a presentation based on research. |
| Resources | | |
| www.pltw.org www.alaskaskillsusa.org www.skillsusa.org | | |