

Principles of Applied Engineering

At-A-Glance - Lamar CISD

Professional Standards/Employability Skills/Technical Skills			
Ongoing Skills Imbedded All Year	PAE 1(A) The student will demonstrate knowledge of how to dress, speak, and conduct oneself in a manner appropriate for the profession. PAE 1(B) The student will show the ability to cooperate, contribute, and collaborate as a member of a group in an effort to achieve a positive collective outcome. PAE 1(C) The student will present written and oral communication in a clear, concise, and effective manner. PAE 1(D) The student will demonstrate time-management skills in prioritizing tasks, following schedules, and performing goal-relevant activities in a way that produces efficient results. PAE 1(E) The student will demonstrate punctuality, dependability, reliability, and responsibility in performing assigned tasks as directed.		
Ongoing Ways to Show			
Grading Period	Unit Name	Estimated Time Frame	TEKS
Grading Period 1 28 Days	Development of Engineering – What is Engineering?	3 Days	2D, 2B, 2C
	PAE 2(D) The student will describe how technological systems interact to achieve common goals. PAE 2(B) The student will identify the inputs, processes, and outputs associated with technological systems. PAE 2(C) The student will describe the difference between open and closed systems.		
	Society & Ethics (Team/Cooperative Learning)	5 Days	1B
	PAE 1(B) The student will show the ability to cooperate, contribute, and collaborate as a member of a group in an effort to achieve a positive collective outcome.		
	Safety in the Workplace	10 Days	4A, 4B, 4C, 4D, 4E, 4F, 4G, 6B
	PAE 4(A) The student will master relevant safety tests. PAE 4(B) The student will follow safety guidelines as prescribed by instructor in compliance with local, state, and federal regulations. PAE 4(C) The student will recognize the classification of hazardous materials and wastes. PAE 4(D) The student will dispose of hazardous materials and wastes appropriately. PAE 4(E) The student will perform maintain, safely handle, and properly store laboratory equipment. PAE 4(F) The student will describe the implications of negligent or improper maintenance. PAE 4(G) The student will demonstrate the use of precision measuring instruments. PAE 6(B) The student will identify the chemical, mechanical, and physical properties of engineering materials.		
	Solving Design Based Problems – Problem Solving, Design & Modeling	3 Days	6A, 6C, 6E, 9A, 9B, 2G
	PAE 6(A) The student will identify and describe the fundamental processes needed for a project, including design and prototype development and initiating, planning, executing, monitoring and controlling, and closing a project. PAE 6(C) The student will use problem-solving techniques to develop technological solutions. PAE 6(E) The student will assess risks and benefits of a design solution. PAE 9(A) The student will apply the design process as a team participant. PAE 9(B) The student will assume different roles as a team member within the project. PAE 2(G) The student will demonstrate proficiency of the engineering design process.		
	Design & Computation Notebook Setup	7 Days	3A, 3B, 3D, 3E, 9C
	PAE 3(A) The student will use clear and concise written, verbal, and visual communication techniques. PAE 3(B) The student will maintain a design and computation engineering notebook. PAE 3(D) The student will use industry standard visualization techniques and media. PAE 3(E) The student will use the engineering documentation process to maintain a paper or digital portfolio. PAE 9(C) The student will maintain an engineering notebook for the project.		

Grading Period 2 25 Days	STEM Rotation 1 w/Team Design Based Project & Testing	20 Days	3A, 9D
	PAE 3(A) The student will use clear and concise written, verbal, and visual communication techniques. PAE 9(D) The student will develop and test the model for the project.		
	Presentation Skills & Technical Communications	5 Days	1A, 1C, 9E
PAE 1(A) The student will demonstrate knowledge of how to dress, speak, and conduct oneself in a manner appropriate for the profession. PAE 1(C) The student will present written and oral communication in a clear, concise, and effective manner. PAE 9(E) The student will demonstrate communication skills by preparing and presenting the project.			
Grading Period 3 25 Days	STEM Rotation 2 w/Team Design Based Project & Testing	17 Days	3A, 9D
	PAE 3(A) The student will use clear and concise written, verbal, and visual communication techniques. PAE 9(D) The student will develop and test the model for the project.		
	Technical Drawing Unit	5 Days	10A, 10B, 10C, 10D, 10E, 10F, 10G, 10H, 10I
	PAE 10(A) The student will set up, create, and modify drawings. PAE 10(B) The student will store and retrieve geometry. PAE 10(C) The student will demonstrate an understanding of the use of line-types in engineering drawings. PAE 10(D) The student will draw 2-D single view objects. PAE 10(E) The student will create multi-view working drawings using orthographic projection. PAE 10(F) The student will dimension objects using current American National Standards Institute (ANSI) standards. PAE 10(G) The student will draw single line 2-D pictorial representations. PAE 10(H) The student will create working drawings that include section views. PAE 10(I) The student will demonstrate a knowledge of screw thread design per ANSI standards by drawing a hex head bolt with standard, square, and acme threads.		
	Semester Review & Exam	3 Days	
Grading Period 4 33 Days	Engineering Careers	5 Days	2A, 2E, 8B, 7C
	PAE 2(A) The student will investigate and report on the history of engineering science. PAE 2(E) The student will compare and contrast engineering, science, and technology careers. PAE 8(B) The student will describe career opportunities in electrical and mechanical systems. PAE 7(C) The student will identify fields and career opportunities related to robotics, process control, and automation systems.		
	STEM Rotation 3 w/Team Design Based Project & Testing	17 Days	3A, 9D
	PAE 3(A) The student will use clear and concise written, verbal, and visual communication techniques. PAE 9(D) The student will develop and test the model for the project.		
	Mechanical and Automation Unit & Coding Project	11 Days	6A, 6D, 7A, 7B, 7D
PAE 6(A) The student will identify and describe the fundamental processes needed for a project, including the design process and prototype development and initiating, planning, executing, monitoring and controlling, and closing a project. PAE 6(D) The student will use consistent units for all measurements and computations. PAE 7(A) The student will describe applications of robotics, process control, and automation systems. PAE 7(B) The student will apply design concepts to problems in robotics, process control, and automation systems. PAE 7(D) The student will identify emerging trends in robotics, process control, and automation systems.			
Grading Period 5 34 Days	Inventors and Inventions Project	12 Days	5A, 5B, 5C, 5D
	PAE 5(A) The student will describe how technology has affected individuals, societies, cultures, economies, and environments. PAE 5(B) The student will describe how the development and use of technology influenced past events. PAE 5(C) The student will describe how and why technology progresses. PAE 5(D) The student will predict possible changes caused by the advances of technology.		
	STEM Rotation 4 w/Team Design Based Project & Testing	17 Days	3A, 9D
PAE 3(A) The student will use clear and concise written, verbal, and visual communication techniques. PAE 9(D) The student will develop and test the model for the project.			

	Engineering System: Structural Engineering Challenge	5 Days	3C, 8A, 8C, 8D
	PAE 3(C) The student will use sketching and computer-aided design (CADD) to develop and present ideas. PAE 8(A) The student will describe the applications of electrical and mechanical systems. PAE 8(C) The student will identify emerging trends in electrical and mechanical systems. PAE 8(D) The student will describe and apply basic electronic theory.		
Grading Period 6 28 Days	STEM Rotation 5 w/Team Design Based Project & Testing	17 Days	3A, 9D
	PAE 3(A) The student will use clear and concise written, verbal, and visual communication techniques. PAE 9(D) The student will develop and test the model for the project.		
	Engineering Disasters	5 Days	2F, 6E
	PAE 2(F) The student will conduct and present research on emerging and innovative technology. PAE 6(E) The student will assess risks and benefits of a design solution.		
	Finalization of Engineering Notebook and Portfolio	5 Days	
	Semester Review & Exam	1 Day	
STEM Rotations	STEM Rotations: Day 1-10 Content		
	Flight IEU		8A, 8C, 2D
	PAE 8(A) The student will describe the applications of electrical and mechanical systems. PAE 8(C) The student will identify emerging trends in electrical and mechanical systems. PAE 2(D) The student will describe how technological systems interact to achieve common goals.		
	Rocket Simulator		2D
	PAE 2(D) The student will describe how technological systems interact to achieve common goals.		
	Compressed Air Rocket		9D, 2D
	PAE 9(D) The student will develop and test the model for the project. PAE 2(D) The student will describe how technological systems interact to achieve common goals.		
	Narrative Writing: Principles of Flight		3A, 2D
	PAE 3(A) The student will use clear and concise written, verbal, and visual communication techniques. PAE 2(D) The student will describe how technological systems interact to achieve common goals.		
	Rocket Launch		9D, 4A
	PAE 9(D) The student will develop and test the model for the project. PAE 4(A) The student will master relevant safety tests.		
	Design Brief		1A, 1B, 1C, 1D, 1E, 2G, 3A, 3E, 9D
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	Informative Research Writing		2F
	PAE 2(F) The student will conduct and present research on emerging and innovative technology.		
	Argumentative Writing: Technology Ethics & Society		2A, 3A
	PAE 2(A) The student will investigate and report on the history of engineering science. PAE 3(A) The student will use clear and concise written, verbal, and visual communication techniques.		