

Texas 2017 Proclamation: §130.402 Principles of Applied Engineering

Correlations to the Texas Essential Knowledge and Skills (TEKS)

Correlations to the English Language Proficiency Standards (ELPS)



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Correlation of Engineering Fundamentals, 2e, ©2018 to the Texas Essential Knowledge and Skills (TEKS) Course: §130.402 Principles of Applied Engineering (MLC 9393)

The following chart lists the Knowledge and Skills Statements and Student Expectations for the Texas Essential Knowledge and Skills (TEKS) for Principles of Applied Engineering. For each Student Expectation, the corresponding pages in *Engineering Fundamentals* are listed.

Student Expectations	Textbook Page(s)		
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:			
(1) (A) demonstrate knowledge of how to dress, speak, and conduct oneself in a manner appropriate for the profession	8, 12, 28–30, 42, 133–134, 253, 387		
(1) (B) show the ability to cooperate, contribute, and collaborate as a member of a group in an effort to achieve a positive collective outcome	9, 26, 41, 60, 221, 253		
(1) (C) present written and oral communication in a clear, concise, and effective manner	8, 54–55, 64–65, 132–134		
(1) (D) demonstrate time-management skills in prioritizing tasks, following schedules, and performing goal-relevant activities in a way that produces efficient results	8, 25, 46, 70, 202, 204, 207–208		
 (1) (E) demonstrate punctuality, dependability, reliability, and responsibility in performing assigned tasks as directed 	8, 26, 41, 194		
(2) The student investigates the components of engineering and technology systems. The student is expected to:			
(2) (A) investigate and report on the history of engineering science	16–19, 84		
(2) (B) identify the inputs, processes, and outputs associated with technological systems	59–95, 115–135, 148–154, 230, 232–243		
(2) (C) describe the difference between open and closed systems	240		
(2) (D) describe how technological systems interact to achieve common goals	161, 245, 261–266, 320		
(2) (E) compare and contrast engineering, science, and technology careers	7, 122–125, 139, 326		
(2) (F) conduct and present research on emerging and innovative technology	19, 66, 89, 186–187, 266, 268, 359, 368		



Student Expectations	Textbook Page(s)		
(2) (G) demonstrate proficiency of the engineering design process	38–57, 59–75, 77–95, 97–113		
(3) The student presents conclusions, research findings, and designs using a variety of media throughout the course. The student is expected to:			
(3) (A) use clear and concise written, verbal, and visual communication techniques	8, 26, 64–65, 68–72, 97–113, 120–125, 132–134, 147, 176, 267–269, 282		
(3) (B) maintain a design and computation engineering notebook	62, 54–55, 87, 93		
(3) (C) use sketching and computer-aided drafting and design (CADD) to develop and present ideas	7, 78–82, 97–111, 120–125, 134, 204, 262		
(3) (D) use industry standard visualization techniques and media	84, 89, 97–111, 119, 120–125, 147		
(3) (E) use the engineering documentation process to maintain a paper or digital portfolio	54–55, 62, 64		
(4) The student uses appropriate tools and demonstrates safe work habits. The student is expected to:			
(4) (A) master relevant safety tests	129, 154, 214		
(4) (B) follow lab safety guidelines as prescribed by instructor in compliance with local, state, and federal regulations	129, 214, 342–343		
(4) (C) recognize the classification of hazardous materials and wastes	30, 34, 189, 201, 342		
(4) (D) dispose of hazardous materials and wastes appropriately	30, 34, 189, 201, 264, 342		
(4) (E) maintain, safely handle, and properly store laboratory equipment	344		
(4) (F) describe the implications of negligent or improper maintenance	173, 341, 380, 382		
(4) (G) demonstrate the use of precision measuring instruments	144, 204, 232–233, 335		
(5) The student describes the factors that affect the progression of technology and the potential intended and unintended consequences of technological advances. The student is expected to:			
(5) (A) describe how technology has affected individuals, societies, cultures, economies, and environments	16–19, 29, 31–32, 34, 130, 132, 173, 274, 344, 367		
(5) (B) describe how the development and use of technology influenced past events	16–19, 41, 151, 197		
(5) (C) describe how and why technology progresses	16–19, 71, 166, 291–292, 350		



Student Expectations	Textbook Page(s)			
(5) (D) predict possible changes caused by the advances of technology	19, 35			
(6) The student thinks critically and applies fundamental p design to multiple design projects. The student is expected	(6) The student thinks critically and applies fundamental principles of system modeling and design to multiple design projects. The student is expected to:			
(6) (A) 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	39–57, 60–72, 77–93, 97–111, 115–134			
(6) (B) identify the chemical, mechanical, and physical properties of engineering materials	176–179, 181, 184, 278, 331–332, 338, 380			
(6) (C) use problem-solving techniques to develop technological solutions	4–5, 59–75, 87, 245			
(6) (D) use consistent units for all measurements and computations	9, 117–119, 155–159, 178, 228–230, 232, 335–339			
(6) (E) assess the risks and benefits of a design solution	25, 33, 35, 125–130			
(7) The student understands the opportunities and careers in fields related to robotics, process control, and automation systems. The student is expected to:				
(7) (A) describe applications of robotics, process control, and automation systems	262–269			
(7) (B) apply design concepts to problems in robotics, process control, and automation systems	100–101, 262–266			
(7) (C) identify fields and career opportunities related to robotics, process control, and automation systems	194, 252–253, 262–266, 366–367			
(7) (D) identify emerging trends in robotics, process control, and automation systems	201, 262–268, 366–367			
(8) The student understands the opportunities and careers in fields related to electrical and mechanical systems. The student is expected to:				
(8) (A) describe the applications of electrical and mechanical systems	138–139, 159–161, 220–221, 245			
(8) (B) describe career opportunities in electrical and mechanical systems	138–139, 159–161, 220–221, 245			
(8) (C) identify emerging trends in electrical and mechanical systems	161, 245			
(8) (D) describe and apply basic electronic theory	223–225			
(9) The student demonstrates the ability to function as a team member while completing a comprehensive project. The student is expected to:				
(0) (A) apply the design process as a team participant	41 60 63			



Student Expectations	Textbook Page(s)		
(9) (B) assume different roles as a team member within the project	69		
(9) (C) maintain an engineering notebook for the project	54–55, 62, 64, 93		
(9) (D) develop and test the model for the project	48, 116–130, 281, 340		
(9) (E) demonstrate communication skills by preparing and presenting the project	42–50, 52, 59–73, 77–93, 97–111, 132– 134		
(10) The student demonstrates a knowledge of drafting by completing a series of drawings that can be published by various media. The student is expected to:			
(10) (A) set up, create, and modify drawings	46–47, 78–79, 80–82, 93, 97–111, 204		
(10) (B) store and retrieve geometry	48, 82, 116–125, 262–266		
(10) (C) demonstrate an understanding of the use of line- types in engineering drawings	107–110		
(10) (D) draw 2-D single view objects	103–104, 106		
(10) (E) create multi-view working drawings using orthographic projection	50, 101–104, 106		
(10) (F) dimension objects using current American National Standards Institute (ANSI) standards	100–101, 106–107		



English Language Proficiency Standards (ELPS) Correlation

for

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This following chart identifies some of the content in *Engineering Fundamentals* that may provide useful support when addressing specific Texas English Language Proficiency Standards (ELPS).

Standard	Page(s)	Specific Location
(1) Cross-curricular second language acquisition/learning strategies. The ELL uses language learning strategies to develop an awareness of his or her own learning processes in all content areas. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. The student is expected to:		
(1)(A) use prior knowledge and experiences to understand meanings in English	135 249 297 389	Communicating activity #1 Communicating activity #1 Communicating activity #1 Communicating activity #1
(1)(B) monitor oral and written language production and employ self-corrective techniques or other resources	37 135 249 297	Communicating activity #1 Communicating activity #2 Communicating activity #2 Communicating activity #2
(1)(D) speak using learning strategies such as requesting assistance, employing non-verbal cues, and using synonyms and circumlocution (conveying ideas by defining or describing when exact English words are not known)	37 135 163 249 297 323	Communicating activity #1 Communicating activity #2 Communicating activity #2 Communicating activity #2 Communicating activity #2 Communicating activity #2
(1)(F) use accessible language and learn new and essential language in the process	135 249 297 389	Communicating activity #1 Communicating activity #1 Communicating activity #1 Communicating activity #1

(2) Cross-curricular second language acquisition/listening. The ELL listens to a variety of speakers including teachers, peers, and electronic media to gain an increasing level of comprehension of newly acquired language in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in listening. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. The student is expected to:



Standard	Page(s)	Specific Location
(2)(C) learn new language structures, expressions,	57	Communicating activity #1
and basic and academic vocabulary heard during	75	Communicating activity #2
classroom instruction and interactions	95	Communicating activity #1
	135	Communicating activity #1
	249	Communicating activity #1
	297	Communicating activity #1
	371	Communicating activity #1
	389	Communicating activity #1
(2)(D) monitor understanding of spoken language	57	Communicating activity #1
during classroom instruction and interactions and	95	Communicating activity #2
seek clarification as needed	249	Communicating activity #2
	371	Communicating activity #1
(2)(E) use visual, contextual, and linguistic support to	21	Communicating activity #1
enhance and confirm understanding of increasingly	57	Communicating activity #2
complex and elaborated spoken language	75	Communicating activity #1
	113	Communicating activity #1
	163	Communicating activity #2
	271	Communicating activity #1
	323	Communicating activity #2
	347	Communicating activity #1
(2)(I) demonstrate listening comprehension of	57	Communicating activity #1
increasingly complex spoken English by following directions, retelling or summarizing spoken messages, responding to questions and requests, collaborating with peers, and taking notes commensurate with content and grade-level needs	75	Communicating activity #1
	95	Communicating activity #2
	113	Communicating activity #2
	135	Communicating activity #1
	249	Communicating activity #1
	297	Communicating activity #2
	371	Communicating activity #1
	389	Communicating activity #1

(3) Cross-curricular second language acquisition/speaking. The ELL speaks in a variety of modes for a variety of purposes with an awareness of different language registers (formal/informal) using vocabulary with increasing fluency and accuracy in language arts and all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in speaking. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. The student is expected to:



Standard	Page(s)	Specific Location
(3)(B) expand and internalize initial English vocabulary by learning and using high-frequency	74	Communicating activity #1
	135	Communicating activity #1
English words necessary for identifying and describing	249	Communicating activity #1
and basic information represented or supported by	249	Communicating activity #2
pictures, and by learning and using routine language	297	Communicating activity #1
needed for classroom communication	389	Communicating activity #1
(3)(C) speak using a variety of grammatical structures,	75	Communicating activity #1
sentence lengths, sentence types, and connecting	249	Communicating activity #2
English is acquired	271	Communicating activity #2
	347	Communicating activity #1
(3)(D) speak using grade-level content area	37	Communicating activity #1
vocabulary in context to internalize new English	57	Communicating activity #1
words and build academic language proficiency	75	Communicating activity #1
	75	Communicating activity #2
	163	Communicating activity #2
	249	Communicating activity #2
	297	Communicating activity #2
	323	Communicating activity #2
	371	Communicating activity #1
(3)(E) share information in cooperative learning	75	Communicating activity #2
interactions	163	Communicating activity #2
	191	Communicating activity #2
	323	Communicating activity #2
(3)(F) ask and give information ranging from using a	21	Communicating activity #2
very limited bank of high-frequency, high-need,	37	Communicating activity #2
expressions needed for basic communication in	75	Communicating activity #1
academic and social contexts, to using abstract and	163	Communicating activity #2
content-based vocabulary during extended speaking	190	Communicating activity #1
assignments	323	Communicating activity #1
	389	Communicating activity #2
(3)(G) express opinions, ideas, and feelings ranging	21	Communicating activity #1
from communicating single words and short phrases	57	Communicating activity #2
to participating in extended discussions on a variety of social and grade-appropriate academic topics	95	Communicating activity #1
	113	Communicating activity #1
	271	Communicating activity #1
	347	Communicating activity #1



Standard	Page(s)	Specific Location
(3)(H) narrate, describe, and explain with increasing specificity and detail as more English is acquired	75	Communicating activity #1
	135	Communicating activity #1
	249	Communicating activity #1
	297	Communicating activity #1
	389	Communicating activity #1

(4) Cross-curricular second language acquisition/reading. The ELL reads a variety of texts for a variety of purposes with an increasing level of comprehension in all content areas. ELLs may be at the beginning, intermediate, advanced, or advanced high stage of English language acquisition in reading. In order for the ELL to meet grade-level learning expectations across the foundation and enrichment curriculum, all instruction delivered in English must be linguistically accommodated (communicated, sequenced, and scaffolded) commensurate with the student's level of English language proficiency. For kindergarten and first grade, certain of these student expectations apply to text read aloud for students not yet at the stage of decoding written text. The student is expected to:

(4)(C) develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials	113 135	Communicating activity #2 Communicating activity #2
(4)(F) use visual and contextual support and support	21	Communicating activity #1
from peers and teachers to read grade-appropriate	57	Communicating activity #1
content area text, enhance and confirm	57	Communicating activity #2
language structures, and background knowledge	75	Communicating activity #2
needed to comprehend increasingly challenging	95	Communicating activity #1
language	95	Communicating activity #2
	113	Communicating activity #2
	135	Communicating activity #2
	163	Communicating activity #2
	191	Communicating activity #2
	249	Communicating activity #2
	271	Communicating activity #1
	323	Communicating activity #2
	347	Communicating activity #1
	371	Communicating activity #1



Standard	Page(s)	Specific Location
(4)(G) demonstrate comprehension of increasingly complex English by participating in shared reading,	37	Communicating activity #1
	57	Communicating activity #1
retelling or summarizing material, responding to questions, and taking notes commensurate with	95	Communicating activity #2
content area and grade level needs	135	Communicating activity #1
	163	Communicating activity #2
	249	Communicating activity #1
	297	Communicating activity #1
	297	Communicating activity #2
	323	Communicating activity #2
	371	Communicating activity #1
	389	Communicating activity #1