eDynamicLearning
CAREER & ELECTIVE COURSES

eDynamic Learning Course Title: Applied Engineering 1a / 1b

State: TX
State Course Title: Principles of Applied Engineering
State Course Code: 130.402
State Standards: Science, Technology, Engineering, and Mathematics
Date of Standards: 2015

TEKS	Course Title. (a or b), if applicable, e.g. Game Design 1a	Unit Name(s)	Lesson(s) Numbers
(1) The student demonstrates professional standards/employability skills as required by business and industry.			
(A) demonstrate knowledge of how to dress, speak, and conduct oneself in a manner appropriate for the profession;	Applied Engineering 1b	Unit 2: Working with the Team	Lesson 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;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Lessons 1, 2
(C) present written and oral communication in a clear, concise, and effective manner;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Activity
(D) demonstrate time-management skills in prioritizing tasks, following schedules, and performing goal-relevant activities in a way that produces efficient results;	Applied Engineering 1b	Unit 2: Working with the Team	Lab, Activity
(E) demonstrate punctuality, dependability, reliability, and responsibility in performing assigned tasks as directed.	Applied Engineering 1b	Unit 2: Working with the Team	Lesson 1
(2) The student investigates the components of engineering and technology systems.			
(A) investigate and report on the history of engineering science;	Applied Engineering 1a	Unit 1: What is Engineering?	Lessons 3, 4
(B) identify the inputs, processes, and outputs associated with technological systems;	Applied Engineering 1a	Unit 3: Circuits: The Building Blocks	Activity 1-3
(C) describe the difference between open and closed systems;	Applied Engineering 1a	Unit 3: Circuits: The Building Blocks	Lesson 1
(D) describe how technological systems interact to achieve common goals;	Applied Engineering 1b	Unit 1: Think About It: Problem Solving in the Real World	Lesson 3
(E) compare and contrast engineering, science, and technology careers;	Applied Engineering 1b	Unit 4: STEM Careers in Action	Lesson 1

(F) conduct and present research on emerging and innovative technology;	Applied Engineering 1b	Unit 6: Look Toward the Future: Developing New Technologies	Lesson 1
(G) demonstrate proficiency of the engineering design process.	Applied Engineering 1a	Unit 7: The Engineering Design Process	Lesson 1
(3) The student presents conclusions, research findings, and designs using a variety of media throughout the course.			
(A) use clear and concise written, verbal, and visual communication techniques;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Activity
(B) maintain a design and computation engineering notebook;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Lesson 1
(C) use sketching and computer-aided drafting and design (CADD) to develop and present ideas;	Applied Engineering 1a	Unit 8: Putting it All Together: Solid Modeling, Technical Drawing and Prototyping	Lessons 2, 3
(D) use industry standard visualization techniques and media;	Applied Engineering 1a	Unit 3: Circuits: The Building Blocks	Activity 1
(E) use the engineering documentation process to maintain a paper or digital portfolio.	Applied Engineering 1a	Unit 7: The Engineering Design Process	Lesson 1
(4) The student uses appropriate tools and demonstrates safe work habits.			
(A) master relevant safety tests;	Applied Engineering 1a	Unit 5: Engineering Tools and Safety	Lesson 3
(B) follow lab safety guidelines as prescribed by instructor in compliance with local, state, and federal regulations;	Applied Engineering 1a	Unit 5: Engineering Tools and Safety	Lesson 3
(C) recognize the classification of hazardous materials and wastes;	Applied Engineering 1a	Unit 5: Engineering Tools and Safety	Lesson 3
(D) dispose of hazardous materials and wastes appropriately;	Applied Engineering 1a	Unit 5: Engineering Tools and Safety	Lesson 3
(E) maintain, safely handle, and properly store laboratory equipment;	Applied Engineering 1a	Unit 5: Engineering Tools and Safety	Lesson 3
(F) describe the implications of negligent or improper maintenance;	Applied Engineering 1a	Unit 5: Engineering Tools and Safety	Lesson 5
(G) demonstrate the use of precision measuring instruments.	Applied Engineering 1a	Unit 2: The Science of Electricity	Lesson 3
(5) The student describes the factors that affect the progression of technology and the potential intended and unintended consequences of technological advances.			
(A) describe how technology has affected individuals, societies, cultures, economies, and environments;	Applied Engineering 1a	Unit 1: What is Engineering?	Lessons 3, 4
(B) describe how the development and use of technology influenced past events;	Applied Engineering 1a	Unit 1: What is Engineering?	Lessons 3, 4

(C) describe how and why technology progresses;	Applied Engineering 1b	Unit 1: Think About It: Problem Solving in the Real World	Lesson 2
(D) predict possible changes caused by the advances of technology.	Applied Engineering 1a	Unit 1: What is Engineering?	Lessons 1, 4
(6) The student thinks critically and applies fundamental principles of system modeling and design to multiple design projects.			
(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;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Lesson 1
(B) identify the chemical, mechanical, and physical properties of engineering materials;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Lesson 1
(C) use problem-solving techniques to develop technological solutions;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Lessons 1-3
(D) use consistent units for all measurements and computations;	Applied Engineering 1a	Unit 2: The Science of Electricity	Lesson 3
(E) assess the risks and benefits of a design solution.	Applied Engineering 1a	Unit 7: The Engineering Design Process	Lesson 1
(7) The student understands the opportunities and careers in fields related to robotics, process control, and automation systems.			
(A) describe applications of robotics, process control, and automation systems;	Applied Engineering 1b	Unit 8: Spotlight on Robotics	Lessons 1-4
(B) apply design concepts to problems in robotics, process control, and automation systems;	Applied Engineering 1b	Unit 8: Spotlight on Robotics	Lessons 1-4
(C) identify fields and career opportunities related to robotics, process control, and automation systems;	Applied Engineering 1b	Unit 8: Spotlight on Robotics	Lesson 4
(D) identify emerging trends in robotics, process control, and automation systems.	Applied Engineering 1b	Unit 8: Spotlight on Robotics	Lessons 1-4
(8) The student understands the opportunities and careers in fields related to electrical and mechanical systems.			
(A) describe the applications of electrical and mechanical systems;	Applied Engineering 1a	Unit 3: Circuits: The Building Blocks	Lesson 1
(B) describe career opportunities in electrical and mechanical systems;	Applied Engineering 1a	Unit 3: Circuits: The Building Blocks	Lesson 1
(C) identify emerging trends in electrical and mechanical systems;	Applied Engineering 1b	Unit 6: Look Toward the Future: Developing New Technologies	Lesson 1
(D) describe and apply basic electronic theory.	Applied Engineering 1a	Unit 2: The Science of Electricity	Lesson 1
(9) The student demonstrates the ability to function as a team member while completing a comprehensive project.			
(A) apply the design process as a team participant;	Applied Engineering 1b	Unit 2: Working with the Team	Lab, Activity

(B) assume different roles as a team member within the project;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Lessons 1, 2
(C) maintain an engineering notebook for the project;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Lesson 1
(D) develop and test the model for the project;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Activity
(E) demonstrate communication skills by preparing and presenting the project	Applied Engineering 1a	Unit 7: The Engineering Design Process	Activity
(10) The student demonstrates a knowledge of drafting by completing a series of drawings that can be published by various media.			
(A) set up, create, and modify drawings;	Applied Engineering 1a	Unit 7: The Engineering Design Process	Activity
(B) store and retrieve geometry;	Applied Engineering 1a	Unit 8: Putting it All Together: Solid Modeling, Technical Drawing and Prototyping	Lessons 1-3
(C) demonstrate an understanding of the use of line-types in engineering drawings;	Applied Engineering 1a	Unit 8: Putting it All Together: Solid Modeling, Technical Drawing and Prototyping	Lesson 2
(D) draw 2-D single view objects;	Applied Engineering 1a	Unit 8: Putting it All Together: Solid Modeling, Technical Drawing and Prototyping	Lab
(E) create multi-view working drawings using orthographic projection;	Applied Engineering 1a	Unit 8: Putting it All Together: Solid Modeling, Technical Drawing and Prototyping	Lab
(F) dimension objects using current American National Standards Institute (ANSI) standards;	Applied Engineering 1a	Unit 8: Putting it All Together: Solid Modeling, Technical Drawing and Prototyping	Lesson 2
(G) draw single line 2-D pictorial representations;	Applied Engineering 1a	Unit 8: Putting it All Together: Solid Modeling, Technical Drawing and Prototyping	Lab

(H) create working drawings that include section views;	Applied Engineering 1a	Unit 8: Putting it All Together: Solid Modeling, Technical Drawing and Prototyping	Lab
(I) demonstrate a knowledge of screw thread design per ANSI standards by drawing a hex head bolt with standard, square, and acme threads.	Applied Engineering 1a	Unit 8: Putting it All Together: Solid Modeling, Technical Drawing and Prototyping	Lesson 2