Educational objectives addressed by the EST Foundations Curriculum.

The value of the educational objectives addressed by the EST Foundations curriculum has been expressed by the Texas Educational Code, Chapter 123 Texas Essential Knowledge and Skills for Technology Education/Industrial Technology Education, Subchapter C. Overview, High School, Section §123.33. "Engineering Principles" (One Credit). The author of EST Foundations has broken the objectives of section 123.33 down into two halves. One half of the objectives have been incorporated into EST Foundations to form a 1/2-credit overview of basic Engineering Principles. It is recommended that the second half of the TEKS defined objectives be collected into a 2nd semester class in order for students to achieve those essential knowledge and skills.

Some of the objectives have been explored in depth by the EST Foundations curriculum. Others are left to the teacher to emphasize according to their discretion, personal experiences, and class interests. The table below lists each of the Knowledge and Skills that have been enumerated in Section 123.33 of the Texas Administrative Code. Those in the left column are addressed by the EST Foundations curriculum. Those in the right hand column are not prioritized by the EST Foundations curriculum (although there will certainly arise opportunities for teachers to pursue these topics with their class). **Important Note**: The inclusion of a general skill in the left-hand column does not mean that each of its enumerated sub-skills is covered in depth by EST Foundations resources.

Knowledge and Skills addressed by EST Foundations	**Knowledge and Skills NOT explicitly targeted by EST Foundations**
(2) The student applies engineering concepts to specific problems. The student is expected to: (A) distinguish between engineering, science, and technology; (B) use engineering concepts to solve practical problems; (C) use calculators and computers to help solve problems; (D) use computers for simulation; (E) use tools and laboratory equipment for testing and evaluation; and (F) use precision measuring instruments. (3) The student designs products or systems using appropriate design processes and techniques. The student is expected to: (A) improve a product or system that meets a specified need; (B) identify areas where quality, reliability, and safety can be designed into a product or system; (C) interpret and produce engineering drawings using standard technical communication techniques; and (D) describe patents and the patenting process. (6) The student builds products or systems using the appropriate tools, equipment, machines, materials and technical processes. The student is expected to: (A) identify the chemical, mechanical, and physical properties of engineering materials;	(1) The student describes how a systems model can be used to describe engineering and technological activities. The student is expected to: (A) identify the inputs, processes, output, and feedback associated with engineering and technological systems; (B) identify the inputs, processes, outputs, and feedback associated with engineering technological activities; (C) describe the difference between open and closed systems; and (D) describe how technological systems interact to achieve common goals. (4) The student investigates emerging and innovative applications of technology in engineering. The student is expected to: (A) report on emerging and innovative applications of technology in engineering; and (B) research and experiment with new technologies. (5) The student describes quality and how it is measured in engineering. The student is expected to: (A) identify different quality control applications in engineering; and (B) describe how customers perceive the quality of products and services and how they affect engineering decisions. (8) The student describes the importance of maintenance. The student is

(B) identify and describe the processes needed to complete a project; (C) use a variety of tools, equipment, machines, and materials; and (D) design and produce an item. (7) The student practices safe work habits. The student is expected to: (A) master relevant safety tests; (B) follow safety manuals, instructions, and requirements; (C) identify and classify hazardous materials and wastes; and (D) dispose of hazardous materials and wastes appropriately. (9) The student manages an engineering project. The student is expected to: (A) participate in the organization and operation of a real or simulated engineering project; and (B) develop a plan for completing an individual project. (13) The student solves problems, thinks critically, and makes decisions related to engineering. The student is expected to: (A) use an engineering approach to problem solving to improve a product; (B) apply critical-thinking strategies to the analysis and evaluation of proposed solutions; and (C) apply decision-making techniques to engineering problems and solutions. (15) The student applies his/her communication, mathematics, and science knowledge and skills to engineering activities. The student is expected to: (A) use written, verbal, and visual communication techniques consistent with industry standards; (B) locate relevant information needed to solve problems; (C) use mathematics concepts to solve engineering problems; (D) identify and apply science principles used to solve problems; and (E) use the appropriate units of measure. (16) The student describes the relationship between engineering and marketing. The student is expected to: (A) prepare a marketing plan for a(n) idea, product, or service;	expected to: (A) perform basic maintenance on selected tools, equipment, and machines; (B) handle and store tools and materials correctly; and (C) describe the results of negligent or improper maintenance. (10) The student applies the appropriate codes, laws, standards, or regulations, such as Occupational Safety and Health Administration (OSHA), National Electrical Code (NEC), American Society for Testing Materials (ASTM), standard symbols, and line weights. The student is expected to: (A) describe the importance of codes, laws, standards, or regulations; (B) identify areas where codes, laws, standards, or regulations may be required; and (C) follow the appropriate codes, laws, standards, or regulations. (11) The student describes the intended and unintended effects of technological solutions. The student is expected to: (A) use an assessment strategy to determine the risks and benefits of engineering activities; and (B) describe how technology has affected individuals, societies, cultures, economies, and environments. (12) The student describes the factors that affect the evolution of technology. The student is expected to: (A) describe how changes in technology affect engineering practices; (B) describe how the development and use of technology in engineering is influenced by past events; (C) discuss the international effects of technology; (D) describe how advancements in technology have affected the field of engineering; (E) describe change and the factors that affect the adoption or rejection of new ideas; and (F) describe how and why technology evolves. (14) The student identifies the factors that influence the cost of an item or service. The student is expected to:

(B) discuss the effect of customer satisfaction on the image of a product or company; and (C) describe how customer demands influence the design of an object. (17) The student selects and reports on career opportunities, requirements, and expectations in engineering and technology. The student is expected to: (A) identify an area of interest in engineering and investigate its entry-level and advancement requirements and its growth potential; (B) distinguish between engineering, science, and technology; (C) describe the various specializations in engineering; and (D) describe the roles and functions of engineers, technologists, and technicians.	(A) work on a budget for a project; and (B) determine the most effective strategies to minimize costs. (18) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to: (A) describe how teams function; (B) use teamwork to solve problems; (C) distinguish between the roles of team leaders and team members; (D) identify characteristics of good leaders; (E) identify employers' expectations and appropriate work habits; (F) define discrimination, harassment, and equality; (G) use time management techniques to develop and maintain work schedules and meet deadlines; and (H) complete his/her work according to established criteria.