

CTE Pre-Engineering Technologies .05

PS 1 – Create an engineering problem statement and define the background knowledge base needed to find a solution.

PS 2 – Identify criteria and constraints for an engineering problem.

PS 3 – Generate and describe multiple ideas that could be used to solve an engineering problem.

PS 4 – Select a primary idea that can solve an engineering problem by evaluating multiple ideas against design criteria and constraints.

PS 5 – Design and build a relevant model or prototype of an idea, while balancing tradeoffs between the accuracy and the cost of the model.

PS 6 – Test an idea by measuring and observing a model or prototype; Summarize and analyze measured and collected data.

PS 7 – Evaluate whether an idea meets design constraints and criteria by using test data to extrapolate towards a full scale model or prototype.

PS 8 – Communicate findings and suggested changes both orally and in written form using an appropriate format for the intended audience.

PS 9 – Demonstrate understanding of Digital Communication systems, including how information is encoded digitally, sent and received using physical waves, and decoded in a ways that increase the probability of accurate communication.

PS 10 – Demonstrate understanding of structural design, including how Newton’s laws of motion can be used to analyze forces at a specific point, how material properties define the ways that a structure will fail, and how different methods for joining and binding materials affects structural strength.

PS 11 – Demonstrate understanding of dynamic fluid systems, including how the equation of continuity and Bernoulli’s equation describe the affect that pressure, area, density, and velocity have on the mass flow rate of a fluid.

PS 12 – Demonstrate understanding of logistics and industrial processes, including how complex systems can be modeled and described, how statistics can be used to understand and plan for rare events, and how every system decision has engineering tradeoffs.

PS 13 – Demonstrate engineering professionalism by collaborating with team members, by meeting deadlines, and by proactively communicating regarding progress.

PS 14 9-10.RST.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

PS 15 9-10.RST.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

PS 16 9-10.WHST.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

PS-17 9-10.WHST.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation