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**Goodheart-Willcox Publisher Correlation of**
***Foundations of Engineering & Technology* ©2019**
**to Alabama Course of Study: CTE**
**Science, Technology, Engineering, and Mathematics (STEM)**
**Course: Applications of Engineering and Technology, Grades 9-12**

| STANDARD | CORRELATING PAGES |
|---|---|
| **Standard Practices** | |
| 1. Apply the design process to problems that can be solved using methods of engineering. | 25, 57 - 38, 57 - 54, 193 - 197, 234 |
| 2. Create a project scope which includes, but is not limited to, a Gantt chart, a budget, and a materials list. | 57 - 64, 193 - 197 |
| **Energy and Power** | |
| 3. Design, create, test, and perform calculations on simple machines, gear trains, and sprockets. | 176 - 180, 191, 407, 409 |
| 4. Investigate the application of multiple energy sources to a variety of systems. | 375 - 394 |
| 5. Describe the features of and explain the differences between series and parallel circuits. | 462 - 464 |
| a. Use Ohms Law to calculate current, voltage, resistance, and power in series and parallel circuits. | 458 |
| 6. Use a multimeter to measure current, voltage, and/or resistance to diagnose and correct problems within a series or parallel circuit. | 458 - 464 |
| **Communication Technologies** | |
| 7. Analyze properties and functionalities of communication technologies. | 13, 239, 241, 424 - 445 |
| 8. Analyze properties and functionalities of laser and fiber optic technologies. | 371, 431 |
| **Materials and Structures** | |
| 9. Calculate unknown forces using vectors. | |
| a. Construct free-body diagrams. | 358 |
| b. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes. | 348 - 350, 352 - 356, 403 - 404 |

| | |
|---|---|
| 10. Calculate weight, density, mass, volume, and surface area of common items. | 107 - 108, 352 - 361 |
| 11. Design, create, test, and perform calculations on structural members using real models and computerized simulations. | 107 - 108, 352 - 361 |
| 12. Use 3D modeling software to examine properties and functionality of objects. | 85 - 89 |
| **Control Systems** | |
| 13. Design, create, and test fluid power devices powered by hydraulics and pneumatics | |
| a. Use appropriate vocabulary to identify components of hydraulic and pneumatic systems. | 410-411 |
| b. Solve for unknown values using established fluid laws. | 410 - 411 |
| 14. Use current programming languages to complete computer-based tasks. | 477 |
| **Statistics** | |
| 15. Construct the five-number summary for a set of data. | |
| a. Perform measures of central tendency, variance, and standard deviation. | 18 - 28 |
| b. Use the normal curve, when appropriate, to compute probabilities concerning a data set, and relate the normal curve to applications of quality control in manufacturing. | 18 - 28 |
| 16. Calculate the probability of single, sequential, and simultaneous events if they are independent, dependent, mutually exclusive and non-mutually exclusive, using tools such as tables and trees and implementing logical operators such as *and, or,* and *not.* | 18 - 28 |
| **Kinematics** | |
| 17. Solve problems involving linear motion, projectiles, and objects in free-fall using kinematics. | |
| a. Design, create, and test a mechanism to launch a projectile in the field. | 567 |
| b. Analyze mathematically relevant components of a parabola. | 567 |