Correlation of

Foundations of Engineering & Technology, **Wright, Strimel, and Grubbs**

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to

Precision Exams Foundations of Technology

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The correlation chart below lists the Standards, Objectives, and Indicators for the Foundations of Technology exam in the left column. Corresponding content from *Foundations of Engineering & Technology* that can be used by a student to help achieve the standard, objective, or indicator is listed in the right column.

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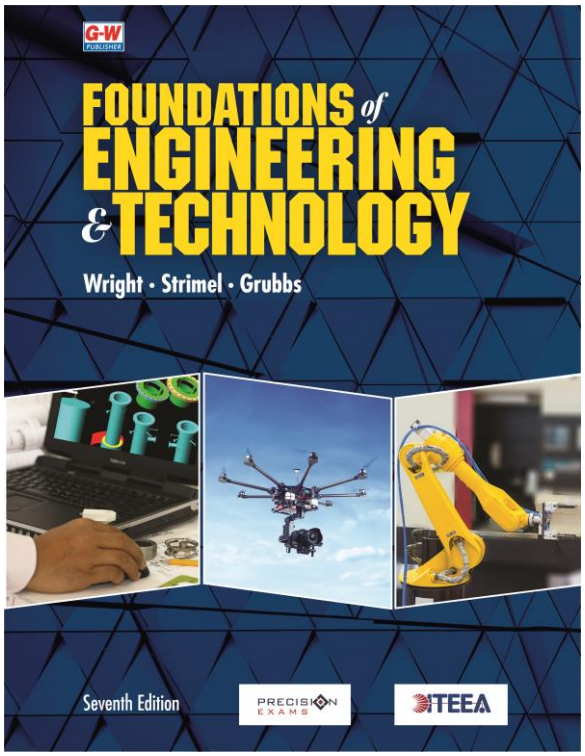

Standards / Objectives / Indicators	Textbook Pages
Standard 1: Understand the importance of technology and how it impacts our lives.	
Objective 1. Students will recognize that technology is how humans modify the world around them to meet their needs and wants or to solve problems and extend their capability.	5, 9–13, 19, 21, 153–154, 637, 638, 640–647
Objective 2. Students will describe and compare the relationships of technology and science.	18–31, 297, 310–311, 520, 531, 537–546, 548
Objective 3. Students will explain both positive and negative impacts of technology on our society, environment, and economy. Ethical implications will also be described.	8, 26, 39–40, 46, 47, 213, 215, 550–551, 640–647, 711–713

Standards / Objectives / Indicators	Textbook Pages
Standard 2: Understand the components of the basic technological system model.	
Objective 1. Students will identify how communication, electrical, fluid, mechanical, and structural systems may be used in these seven areas: communication, construction, manufacturing, transportation, bio-medical, agriculture, and power and energy.	232–245, 246–275, 278–294, 296–314, 316–340, 342–366, 368–397, 398–419, 420–449, 450–481, 482–513, 514–529, 530–549, 552–572, 574–611, 612–632
Objective 2. Students will describe the basic technological system model which includes input, process, output, and feedback.	152–169, 170–190, 192–211, 212–227
Objective 3. Students will identify the technological system inputs (resources) as materials, time, energy, tools/machines, capital, information, and human resources. They will discuss management strategies of resources including the following: reducing, recycling, reusing, and renewing resources.	170–189, 256–267, 369–375
Objective 4. Students will identify and explain the three major types of processes for technological systems as problem solving/design, production and management.	161–164, 192–211
Objective 5. Students will recognize and be able to discuss system outputs as having desirable and undesirable, intended and unintended, and immediate and delayed aspects.	165, 166–167
Standard 3: Understand and apply design principles in developing a process, product, or system.	
Objective 1. Students will understand and apply design principles including the following: structure, function, appearance, safety, durability, reliability, economic and financial feasibility, marketability, quality control, environmental impacts, manufacturability, maintainability, and human factors of engineering (ergonomics), ease of use, ease of assembly, social appropriateness.	51–52, 55, 57, 61, 63, 70–71, 73, 85, 89, 98, 114–115, 286–287, 491–492
Objective 2. Students will classify technologies as inventions or innovations. They will also be able to identify how technological innovations are created or enhanced through connections to other fields of study.	6, 11, 12, 28, 31, 173, 578, 588, 713
Objective 3. Students will understand the concepts and value of planned failure, durable goods and nondurable goods.	288–289
Objective 4. Students will assess trade-offs in terms of the outputs of technological systems. They will also be able to analyze trade-offs in optimizing product design.	89, 115, 288, 645

Standards / Objectives / Indicators	Textbook Pages
Standard 4: Describe and apply the basic steps in the design/problem solving process. • **Stage 1: Problem statement and design brief** • **Stage 2: Investigation and research** • **Stage 3: Generate alternative solutions** • **Stage 4: Choose the best solution** • **Stage 5: Modeling and prototyping** • **Stage 6: Test and evaluate**	
Objective 1. Students will utilize briefs and specifications (criteria and constraints) in order to maximize a solution in their design work. Students will differentiate between a problem/opportunity and a solution.	58, 69, 70–71
Objective 2. Students will investigate and research data that will be useful in developing a design solution using a variety of mediums which may include the following: interview, Internet, databases, books, magazines, video, observation, measurement, and surveys.	58–59, 71–73
Objective 3. Students will brainstorm and creatively generate a multitude of possible solutions to the stated problem or opportunity.	60, 67, 73–75, 90, 93
Objective 4. Students will analyze potential solutions based on design principles (see standard 3) and make a decision as to the best solution.	57, 59–61, 120–129
Objective 5. Students will implement the chosen solution. They will develop and communicate their design using technical sketching and/or drawing techniques, make graphical, mathematical and/or physical models and prototypes.	61, 63, 73–91, 95–98
Objective 6. Students will test their design for features, such as durability, ease of assembly, reliability, strength, environmental impact, quality, safety, and other design principles (see standard 3).	63, 115, 121–128
Objective 7. Students will prepare an evaluation of the design product. This should include an evaluation of the product, the process, and themselves.	63, 121, 122–124
Objective 8. Students will present their solution in a professional manner using a portfolio which may include: engineering drawings, posters, models, PowerPoint® presentations, web site, or other appropriate methods.	64, 131–147
Standard 5: Use resources, tools, materials, and processes safely and efficiently.	
Objective 1. Students will follow general laboratory safety practices.	57, 118–119, 418–419
Objective 2. Students will follow specific equipment safety practices.	118–119, 418–419
Objective 3. Students will identify potential safety hazards and make appropriate precautions or corrections.	124, 430

Standards / Objectives / Indicators	Textbook Pages
Objective 4. Students will be able to describe manufacturing processes for changing materials which are: casting and molding, forming, separating, conditioning, assembling, and finishing.	279, 280–283
Objective 5. Students will use tools, equipment, materials, and processes to produce a working model or prototype of a solution to a technical problem.	118–119, 314, 480–481, 572
Standard 6: Identify components and properties associated with communication, electrical, mechanical, fluid, and structural systems.	
Objective 1. Students will be able to communicate an idea graphically using sketches, isometric drawings, orthographic drawings, schematics, charts, and graphs using either sketching mechanical drawing or computer-aided design (CAD) techniques.	58, 59, 60, 75–88, 96–99
Objective 2. Students will define and explain the following electronic terms and concepts: electricity, electronics, conductor, insulator, semi-conductor, series circuit and parallel circuit, voltage, and resistance.	220, 221, 222, 371–372, 390–394, 418–419, 451, 454–468, 478–479
Objective 3. Students will assemble an electronic circuit. They will understand the use of schematics, function of basic electronic components, and electronic measurement.	418–419, 458–464, 478–479
Objective 4. Students will define and explain the characteristics of mechanical system functions being that of changing speed, power, distance, and direction and apply them in mechanical systems.	369, 390–393, 403–414, 416–417
Objective 5. Students will assemble a mechanical system using gears, pulleys and levers. They will understand the basic components of mechanical components and be able to calculate mechanical advantage.	405–411
Objective 6. Students will define and explain advantages and disadvantages of pneumatic versus hydraulic systems (i.e., quick, slow, powerful, clean, dirty, cost, etc.). They will understand the concept of fluid power as it relates to air and liquid.	410–411, 416, 524
Objective 7. Students will assemble a fluid power system. Students will understand the function of the basic fluid power components: pump, tank, valve, cylinder, piston, and actuator and be able to calculate pressure and force in the system.	222, 266–267, 410–411, 524
Objective 8. Students will be able to define and explain basic structural terminology including: compression, tension, torsion, stress, strain, triangulation, static load, and dynamic load.	321, 324, 325, 334–335, 340–341, 348–360
Objective 9. Students will assemble a structural system.	316–341