

TENNESSEE CAREER AND TECHNICAL EDUCATION TEXTBOOK SCREENING INSTRUMENT

Section I Reviews

Reviewer: Evaluator_2

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| Book: | Engineering Drawing & Design | Publisher: | Cengage Learning Inc. |
| ISBN: | 9781305899384 | Year: | 2017 |
| Levels/Course: | Basal | Category: | 6139 |

SECTION I: ADDITIONAL ALIGNMENT CRITERIA AND INDICATORS OF QUALITY

ALIGNMENT TO THE TENNESSEE CAREER AND TECHNICAL EDUCATION STANDARDS:

Tennessee's Career and Technical Education Standards (hereafter, "the standards") represent a significant shift in the definition of student proficiency within career and technical education environments. Evaluators of materials should understand that the standards replace the proficiency frameworks of years past in three major respects:

- 1) A shift to clear, specific, and measurable expectations for student learning. The standards articulate deep knowledge and skill attainment, departing from the competency-based structure of years past. **Choose an item.**
- 2) Increased focus on rigor in literacy and mathematics within technical contexts. The new standards align to all Tennessee State Standards for English Language Arts and Literacy in Technical Subjects and, where appropriate, select Tennessee State Standards in Mathematics.
- 3) Sequential progression of knowledge and skills within and across courses. The new standards build on each other both within course content and across course levels, arranged within programs of study that culminate in capstone and/or work-based learning experiences for students.

Evaluators of materials must be well versed in the standards for the course(s) aligned to the materials in question, how the content fits into the progressions in the content standards, and the expectations of the standards with respect to conceptual understanding, fluency, and technical application.

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| Section I (1):<u>FOCUS:</u> Students and teachers using the materials as designed devote the majority of time in each level to the course standards.* | |
| METRICS: | YES/NO |
| A. In any single course level, materials are designed where there is 80%** alignment to the course standards (see Appendix A, 12). | No |
| B. All materials are appropriate for the designated course level, both in terms of content and in terms of language. For materials spanning multiple course levels and/or grade bands, content is presented at the appropriate grain size (i.e., level of detail) commensurate to expectations in the standard. | Yes |
| C. Materials focus equally on the <i>conceptual knowledge</i> as well as the <i>technical skill</i> outlined in the standards. | Yes |
| D. Topics do not deviate from the content outlined in the course standards. Topics may go “above and beyond” stated learning expectations, but not in a manner that distracts from the focus on specific knowledge and skills as determined by the standards. | No |
| To be aligned to the Tennessee Standards, materials for each level must attend to all four indicators of Focus. All four indicators must be marked Yes. | Meet? No |

Justification/Notes:

Although this book is an excellent reference for engineering drafting, the book is not suitable for the course "Engineering Design I". The book content is too specific to be adopted for the course, and only satisfies about 50-60% of the course standards.

Out of the 25 standards, there are at least nine standards that are very insufficiently addressed or not addressed at all by the book, in addition to one standard that is partially addressed. In total, the book addresses to some degree 15 standards out of the 25 (about 50 ~ 60 % of the standards). The standards that were not satisfied by the book are shown here below.

Furthermore, the course description states that some of the outcomes of the course include, that upon completion of the course, the students will be able to "identify simple and complex machines, calculate various ratios related to mechanism, ..., explain fundamental concepts related to energy; understand Ohm's Law, ..." The book content is not suitable to yield these outcomes. For example, the engineering concept of "Mechanical Advantage" (see standard 13), and energy calculations are not addressed anywhere in the book, neither is Ohm's law.

The book does not address the following standards:

Standard 1- Safety: the book does not address any safety requirements nor safety operating procedures. For example, the book does not address any OSHA safety guidelines, a search for the word "OSHA" in the textbook returns zero results. Addressing safety is a core issue for high school student learning to remind the students of the importance of following safety procedures in every aspect and every field of engineering.

Standard 12- Force, Work, and Power: The book does not address the calculation of any of these physical quantities in anyway. The standard is completely absent in the book content.

Standard 10- Only half of it is addressed in the book.

In addition to that Standards 13 , 16, 17, 18, 20, and 21 are not addressed at all.

Standard 24- The book does not outline any software for problem solving. The standard is therefore not satisfied.

Based on the review, the book is not recommended for adoption for the high schools in the State of Tennessee. The book is an excellent reference and a good textbook for a college level course in engineering drawing and drafting, but it is not suitable for the "Engineering Design I" course.

*For the purposes of this document, Tennessee CTE students are considered to be enrolled in course "levels" (i.e., Level 1, Level 2, Level 3, and Level 4) due to variation in the *grade* level at which students may take a course. For example, a tenth-grade student may be enrolled in a Level 1 course. For this reason, reviewers are asked to evaluate materials on the basis of their alignment to particular *course levels*, not *grade levels* or *grade bands*.

**This percentage is a guide. Reviewers should not attempt to compute percentages based on counting pages or counting lessons. Reviewers will use their professional judgment to determine how students are meant to spend their time to determine focus and provide evidence for their decision.

Section I (2): RIGOR

Each level's instructional materials reflect high expectations for all students. They follow faithfully the level of rigor intended in the standards and support student learning through high-quality presentation of content and challenging application.

| METRICS: | YES/NO |
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| A. Materials effectively meet the level of rigor intended in the standards. | No |
| B. High-quality problems and questions designed to invite exploration and support conceptual understanding are included throughout. A variety of problems, both conceptual and technical, enable students to connect course content and transfer understandings to new situations. | Yes |
| C. All materials reinforce literacy and mathematics instruction in career and technical education environments. Texts are of an appropriately challenging Lexile level; mathematics problems push students to apply quantitative reasoning to specific technical situations. | No |
| D. Materials support the development of fluency, including regular opportunities to practice knowledge and skills, appropriately apply tools, and use technology. | Yes |
| E. Domain-specific vocabulary and industry terminology are frequently used to explain topics, or to make connections to key workplace activities. | Yes |
| To be aligned to the standards, all five indicators of Rigor must be marked Yes. | Meet? No |
| Justification/Notes: | |

Section I (3): POSTSECONDARY AND CAREER READINESS:

Materials promote multiple pathways to student success beyond high school, highlighting a range of career opportunities aligned with entry and exit points to and from appropriate postsecondary programs. Aligned pathways are presented in a fair and balanced fashion that underscores the need for advanced training beyond high school, but does not privilege one set of credentials over another and is consistent with occupational requirements.

| METRICS: | YES/NO |
|---|------------------|
| A. Technical skills are promoted within the context of applicable industries and work environments. They are <i>not</i> presented in isolation or without meaningful connections to aligned careers. | Yes |
| B. Materials showcase a diversity of career and postsecondary opportunities for students upon completion of high school, including all applicable levels of postsecondary training (i.e., technical schools, community colleges, four-year universities, etc.). | Yes |
| C. Connections to relevant certifications and other credentials are clearly explained, and their value in industry is communicated where appropriate. | Yes |
| D. Materials provide opportunities for students to practice and reflect upon 21st century (or “soft”) skills. | Yes |
| To be aligned to the standards, all four indicators of Postsecondary and Career Readiness must be marked Yes. | Meet? Yes |
| Justification/Notes: Career opportunities, different levels of postsecondary training, as well as relevant certifications are well- presented in chapter 1. | |

**Were all three non-negotiables in section I met?
(Was each component marked “yes”?)**

No