

ITEA/CTTE/NCATE Curriculum Standards

Initial Programs in Technology Teacher Education

Prepared by

*International Technology Education Association/
Council on Technology Teacher Education
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Guidelines were approved by the National Council for Accreditation of Teacher Education, known as NCATE in April 1987, revised in October 1992 and October 1997, and new ITEA/CTTE/NCATE curriculum standards were approved in October 2003. Institutions are required to respond to these standards for initial technology teacher education programs.

Institutions seeking NCATE accreditation are required to respond to the ITEA/CTTE/NCATE curriculum standards included in this document. The full set of ITEA/CTTE/NCATE curriculum standards for the preparation of technology teacher education programs is available from the International Technology Education Association/Council on Technology Teacher Education, 1914 Association Drive, Reston, VA 22091. The new curriculum standards can also be found on the CTTE web site <http://teched.vt.edu/CTTE>

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Introduction

Technology education is a discipline designed to promote technological literacy at the K-12 grade level. It is the intent of such study to provide technology students with an understanding of their technological culture so they can become intelligent consumers of their technology. Therefore, technology education programs are designed to produce individuals who can solve problems involving the technical means humans use for their survival. Technology education programs capitalize on the need humans have for expressing themselves with tools and materials. Technological literacy is considered a basic and fundamental study for all people regardless of educational or career goals.

In the field of technology teacher education, accreditation has taken on a more important role. In the past 15 years, guidelines and standards for accreditation have been implemented into many universities. More recently, through the efforts of many individuals in the field of technology teacher education, the Technology for All Americans Project has developed *Standards for Technological Literacy: Content for the Study of Technology* (ITEA, 2000). These standards will continue to guide the technology education profession as new ITEA/CTTE/NCATE standards are reviewed and updated every five years. It should be noted that these ITEA/CTTE/NCATE curriculum standards have been written in such a manner that the technology teacher education candidate will be able to provide positive effects to enhance student learning at the K-12 level.

Definitions

The following definitions of terms will help the reader understand the fields of technology and technology education.

1. **Technological literacy**—The ability to use, manage, understand, and assess technology.
2. **Technological problem-solving**—The process of understanding a technological problem, devising a plan, carrying out the plan, and evaluating the plan in order to solve a problem or meet a need or want.
3. **Technological products and systems**—Products and systems that use or relate to technology.
4. **Technologically literate**—Having technological literacy; capable of understanding—with increasing sophistication—what technology is, how it is created, how it shapes society, and in turn is shaped by society.
5. **Technology**—
 1. The innovation, change, or modification of the natural environment to satisfy perceived human needs and wants.
 2. Human innovation in action that involves the generation of knowledge and processes to develop systems that solve problems and extend human capabilities.
6. **Technology education**— An interdisciplinary study of technology across grade levels that provides opportunities throughout content area studies for students to learn about the processes and knowledge related to technology needed to solve problems and extend human capabilities.

7. **Technology teacher education program**—The study of the technology methods and procedures at the university level to prepare teacher candidates to teach technology education in grades K-12.

Knowledge Base For Technology Education

A subject area can be defined as having a stand-alone knowledge base validated by research. A sound knowledge base is important because it validates the standards and guidelines for the particular field. Within the field of technology education, there has been a continuous progression of research in the development of technological content. The following depicts the progression of research over the past 20 years.

Jackson's Mill Curriculum Theory

In the field of technology education, there is documented history of changing its knowledge base from the study of industry to technology. Today, it is the study of technology. The technology education profession has undergone curricular and programmatic changes since the *Jackson's Mill Curriculum Theory (Jackson's Mill Project)* was published in 1981 (Snyder & Hales, 1981). This research and the supporting documents called for far-reaching changes. One major change was the recognition of technology as a viable knowledge base. A second was the way technology education was structured and delivered at the elementary, middle, high school, and post-secondary levels.

The knowledge base and guidelines established for technology teacher education programs have been refined since their adoption in 1987. The first and second editions of the ITEA/CTTE/NCATE *Curriculum Guidelines*, that were approved by the SASB in 1987 and 1992, relied heavily on the research, recommendations, and conclusions provided by the *Jackson's Mill Project*.

Conceptual Framework for Technology Education

After the *Jackson's Mill Project*, the knowledge base and research used to revise the guidelines that were approved in 1997 by SASB were based upon *A Conceptual Framework for Technology Education* (Savage & Sterry, 1991). The knowledge base was established through research conducted by practicing technology education teachers, teacher educators, administrators, and other leaders working with the ITEA. This refined knowledge base has allowed technology teacher education programs to increasingly focus instruction on critical technological analysis and technological problem-solving, rather than on product and materials-processing related instructional methodologies. The identified knowledge base organizers for developing curriculum were the technological systems of communicating, constructing, manufacturing, and transporting.

Since 1990, there have been numerous published documents that have contributed to the knowledge base of technology education. One was the 44th CTTE Yearbook, *Foundations of Technology Education* (Martin, 1996). This document, researched and written by leaders in the profession, presented a complete review of the most current thinking in the field of technology education pertaining to the basis for technology education, curriculum theory, professional practices, and leadership. A second was *A Rationale and Structure for the Study of Technology*

(ITEA, 1996). This research publication outlined the rationale and structure for the study of technology and was the knowledge base for *ITEA's Standards for Technological Literacy*.

The CTTE has also developed other yearbooks that have contributed significantly to the knowledge base for technology education. Some of the more important titles include:

- Kemp, W.H., & Schwaller, A.E. (1988). *Instructional strategies for technology education*. New York: Glencoe McGraw-Hill.
- Liedtke, J. A. (1990). *Communication in technology education*. New York: Glencoe McGraw-Hill.
- Dyrenfurth, M. R., & Kozak, M. R. (1991). *Technological literacy*. New York: Glencoe McGraw-Hill.
- Wright, J. R., & Komacek, S. (1992). *Transportation in technology education*. New York: Glencoe McGraw-Hill.
- Seymour, R. D., & Shackelford, R. L. (1993). *Manufacturing in technology education*. New York: Glencoe McGraw-Hill.
- Wescott, J. W., & Henak, R. M. (1994). *Construction in technology education*. New York: Glencoe McGraw-Hill.
- Custer, R. L., & Wiens, E. A. (1996). *Technology and the quality of life*. New York: Glencoe McGraw-Hill.
- Rider, B. L. (1998). *Diversity in technology education*. New York: Glencoe McGraw-Hill.
- Martin, E. G. (2000). *Technology education for the 21st century: A collection of essays*. New York: Glencoe McGraw-Hill.
- Ritz, J. M., Dugger, W. E., & Israel E. N. (Eds.) (2002). *Standards for Technological Literacy, The Role of Teacher Education: Fifty-first yearbook of the Council on Technology Teacher Education*. New York: Glencoe McGraw-Hill.
- Helgeson K. & Schwaller, A. E. (2003). *Selecting Instructional Strategies for Technology Education*. New York: Glencoe McGraw-Hill.

The Technology for All Americans Project as a Knowledge Base

The information presented in the *A Rationale and Structure for the Study of Technology* (ITEA, 1996) was the basis for the development of *Standards for Technological Literacy: Content for the Study of Technology* (ITEA, 2000). Often referred to as *STL*, this project developed national technological literacy standards for K-12 technology teacher education programs. The National Science Foundation (NSF) and National Aeronautics and Space Administration (NASA) funded this project. The *STL* project took approximately four years to complete and was presented to the technology education profession at the ITEA Conference in Salt Lake City, April 2000.

The vision of achieving technological literacy for all people is a fundamental tenet of *STL*. These standards and related benchmarks identify what all students need to know and be able to do to progress toward technological literacy. *STL* provides a foundation upon which technology teacher education programs may be built. Good teaching practices, coordinated with standards-based content, quality curriculum materials, effective program development,

progressive professional development, and carefully planned and articulated assessment provide the power that brings the learning process to life.

Who Should Respond to ITEA/CTTE/NCATE Curriculum Standards?

All technology teacher education programs with the mission of preparing technology education teachers should respond to these standards. If your program is a vocational program based on a philosophy different than technology education addressed by these standards, you are not required to respond to these standards. You should respond to these standards if the institution offers an **initial certification program in technology teacher education**. These ITEA/CTTE/NCATE curriculum standards are not to be used for any advanced technology teacher education program review at the graduate level. Presently, there are no approved advanced (graduate) curriculum standards for technology teacher education programs that have been approved by NCATE and the SASB. Please contact either the ITEA or NCATE offices for further information if necessary.

The Program Report Review Process

The purpose of this section is to provide guidance for technology teacher education program faculty who are preparing a program report for accreditation. This information was reviewed by representatives of the International Technology Education Association (ITEA) and the Council on Technology Teacher Education (CTTE) as part of the accreditation process conducted by the National Council for the Accreditation of Teacher Education (NCATE). The intent of the program report review process is to ensure that technology teacher education programs are preparing effective teachers of technology education for our schools.

Institutions with technology teacher education programs seeking NCATE recognition are encouraged to respond to the standards developed by the ITEA/CTTE. To respond to these standards, each technology teacher education program must assemble a program report. Representatives (program report reviewers) of ITEA/CTTE will review the program report submitted by the institution seeking recognition and make recommendations to the NCATE, which acts upon CTTE's recommendations.

The specialty area review process is separate from the NCATE on-site unit review process and precedes it by approximately one and one-half years. When the institution seeks unit accreditation, the most recent revision of the document, *ITEA/CTTE/NCATE Curriculum Standards*, is made available to the institution approximately three years prior to the scheduled on-site review. The program report for technology teacher education programs is to be prepared in accordance with the ITEA/CTTE/NCATE standards that are in effect at the time of the program report writing.

The ITEA/CTTE/NCATE standards have been developed with the understanding that appropriate definitions of technology education have been identified and the attributes of the definitions are reflected in the technology teacher education program and curriculum structure.

During the program report writing process, it is the responsibility of the writers to ensure that the program report is a clear, concise, accurate and comprehensive description of how the technology teacher education program meets the ITEA/CTTE/NCATE standards at their institution. After the program report is reviewed, the writers should be prepared to respond to requests for clarification and explanation, through a rejoinder if some standards are not met. It is important to complete the program report in a timely manner, since the program report review schedule is tied to the institutional schedule for meeting unit accreditation.

Timeline

Table 1 is an NCATE Unit Accreditation Timeline that is communicated to each technology teacher education program that is seeking accreditation. Four copies of the curriculum program report must be sent to NCATE with the institution's (units) precondition package on the following time schedule:

Table 1-NCATE Unit Accreditation Timeline

NCATE on-campus visit:	SPA program report to NCATE by:	NCATE responses available by:
Spring 2004	October 1 st , 2002	February 2003
Fall 2004	April 1 st , 2003	September 2003
Spring 2005	October 1 st , 2003	February 2004
Fall 2005	April 1 st , 2004	September 2004
Spring 2006	October 1 st , 2004	February 2005
Fall 2006	April 1 st , 2005	September 2005
Spring 2007	October 1 st , 2005	February 2006
Fall 2007	April 1 st , 2006	September 2006
Spring 2008	October 1 st , 2006	February 2007
Fall 2008	April 1 st , 2007	September 2007

Specialty Area Communications Processes

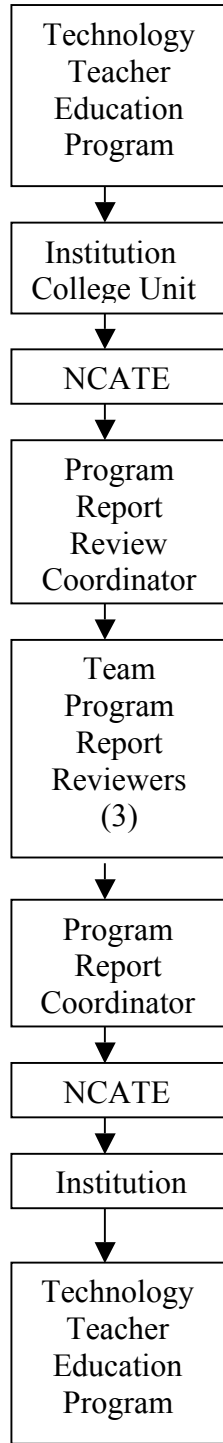
In order to properly communicate with technology teacher education programs that seek ITEA/CTTE/NCATE approval, the following communications processes have been developed as shown on page 7 of this section. It shows the communication processes in which a program report goes through from the technology teacher education program to NCATE. When developing a program report, it is encouraged that the program report writers use these communication processes as necessary. Essentially, there are three communications flow processes during program report development. These include:

1. **Communications Process for Initial Review**— This part of the chart illustrates the communication process for program reports when they are initially reviewed for approval. The communication process includes moving from the technology teacher education program to the institution, to NCATE, to the CTTE review process, back to NCATE, then to the institution, and finally back to the technology teacher education program.
2. **Communication Process Requesting Additional Information** – This part of the chart illustrates the communication process for program reports when additional information is needed by the program report review coordinator and the team program report reviewers to aid in their review. In this case communication occurs directly between the technology teacher education program and the program report coordinator and program report review process.
3. **Communication Process for Rejoinders and Programs Pass with Conditions**—Illustrates the communication process in cases where the technology teacher education program needs to write a *rejoinder* or when the technology teacher education program *meets standards with conditions*. The communication process is from the technology teacher education program to the institution, to NCATE, to the program report coordinator and team program report reviewers, to NCATE, to the institution, and then back to the technology teacher education program.

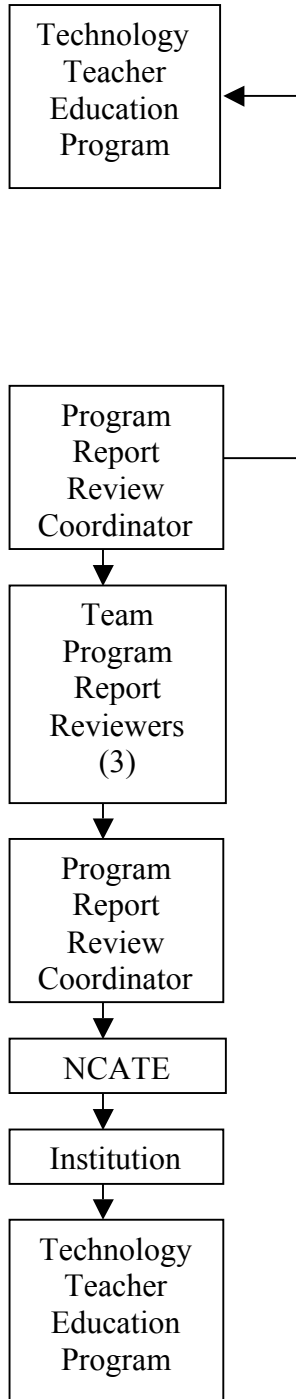
To enhance communications between technology teacher education programs, the program report coordinator, and NCATE, communications technology is often used. Presently, all technology teacher educators have been included in a directory entitled the “Industrial Teacher Education Directory,” published by CTTE. This directory, in which an updated copy is sent to each technology teacher education program in the United States each year, includes such information as the name of the person, the area of teaching, their phone numbers, fax numbers, and all e-mail addresses so as to enhance electronic communications.

Specialty Area Assessment Process

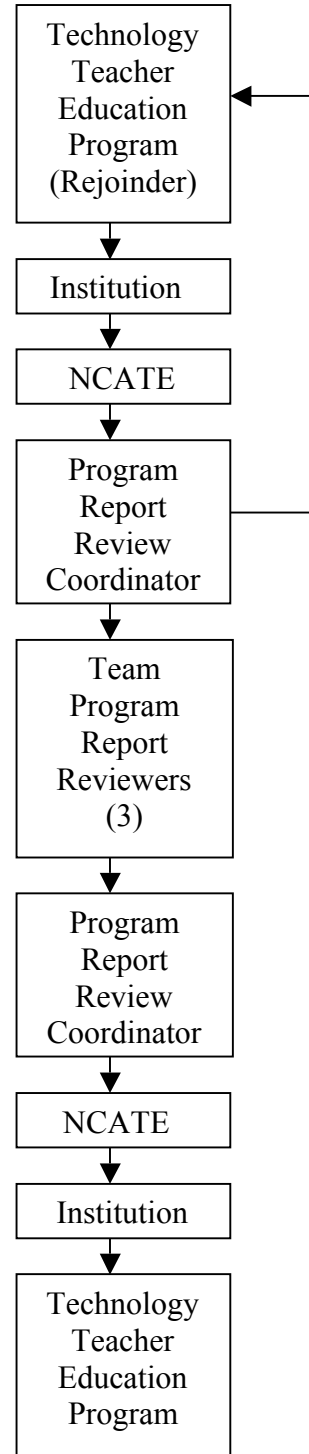
Initial Review



Additional Information Needed



Recognized With Conditions



State Standard Review Process

Over the past several years, many states have developed a partnership agreement with NCATE (NCATE, 1993). These partnership agreements are made through the State Partnership Board (SPB) of NCATE. They are made to reduce duplication of standards used during state review of programs for the purposes of technology teacher program approval and licensure and certification review processes.

Typically, each state has a set of specialty area subject matter standards or guidelines for licensure of technology teacher education program candidates. In addition, there are the ITEA/CTTE/NCATE standards found in this document. Thus, it is important that states work closely with NCATE and ITEA/CTTE to have a common set of standards. The two sets of standards must be parallel and/or similar in content. There are several frameworks between states and NCATE as shown in Table 2 on page 10 of this section.

For more information on state partnerships, go to the following website: <http://www.ncate.org> and click on “State Partnerships.”

The CTTE Accreditation Committee has developed an NCATE approval process to review technology teacher education program state licensure guidelines standards. When a state request to have its licensure guidelines reviewed by NCATE and CTTE, the following process is followed.

1. The state contacts the chairperson of the CTTE Accreditation Committee to request review of the state standards or assistance in developing technology teacher education program standards similar to the *ITEA/CTTE/NCATE Standards*
2. The chairperson of the Accreditation Committee forwards the name of a trained program report reviewer in that geographical area of the state to contact.
3. The ITEA/CTTE/NCATE program report reviewer and the state representative then meet to determine needed assistance. For example, state licensure standards may need to be written to be more in-line with *ITEA/CTTE/NCATE Standards*.
4. The ITEA/CTTE/NCATE program report reviewer establishes a three-member committee consisting of two other regional program report reviewers to assist in the development of comparison between the specialty area and state licensure standards.
5. After review of the state licensure standards, the three-member committee may accept, reject, or encourage modifications of the state’s standards. Depending upon the degree of comparison, they may continue to assist in the refinement of the state licensure standards.
6. Future university technology teacher education program reports prepared for state review can now be either approved by the state licensure team or by the normal ITEA/CTTE program report review process, depending upon the exact wording of the NCATE and state agreement.

NCATE State Partnership Frameworks

Although each state partnership may be different, the information in **Table 3** will guide institutions as to the type of NCATE State Partnership Framework that has been agreed upon in each state. If you are from an institution in one of these states listed in the first column, you will be using the approved ITEA/CTTE/NCATE standards included in this document to write your program report. If you are from an institution in one of the states listed in the second column, you can either use the approved ITEA/CTTE/NCATE standards in this document, or use the state technology teacher education program standards that are available when writing the program report. If you are from an institution in one of the states listed in the third column, you will be required to write a performance-based program report. Please contact NCATE for more information about state partnerships.

Rejoinder

When an institution receives an overall rating of “Not Recognized” or “Recognized with Conditions” on their initial program report, they need to write a “rejoinder.” A rejoinder is a document that addresses items that received a “Not Met” or “Met with Conditions” on the program report. The institution does not need to completely re-write the program report. They should focus on only those items that have not received a completely “met” rating.

If the institution can provide further documentation and evidence for those items in question, they should write an explanation using the same format as the original program report and enclose the additional evidence. A rejoinder is usually done within 4-6 months after the summary report is received back from NCATE. It is submitted through the institution’s NCATE coordinator to NCATE. NCATE, in turn, submits it to the ITEA/CTTE program report review coordinator who sends it out to the original reviewers. The original reviewers will examine the new information and make a judgment based on this information.

Some times it takes the institution a year or two to implement major changes in their curriculum and program, or to gather more extensive student performance data. The institution should not rush to complete the rejoinder if changes have to be made or more time is needed to collect data.

There is no need to re-submit the entire program report. The institution should submit the narrative and evidence of the in-question items, along with the appropriate cover pages and appendices.

Table 2

NCATE State Partnership Frameworks

NCATE-BASED		NCATE STATE-BASED		PERFORMANCE-BASED	
NCATE Unit Review	NCATE Program Review	NCATE Unit Review	STATE Program Review	NCATE Unit Review	STATE Performance Assessment
<p>NCATE conducts the review of the unit and content area preparation using national specialized professional association program standards. The state uses evidence from NCATE's accreditation findings in making independent state approval decisions for the institution and its content area preparation programs.</p>		<p>NCATE reviews the operation of the unit and the state reviews content preparation programs using its own process and standards. State program standards are subject to NCATE recognition based on program reviews by national specialized professional associations. The results of these reviews and the review of the Process and Evaluation Committee, may require institutions to submit program documents to NCATE if they desire national recognition for programs.</p>		<p>The state establishes a comprehensive performance-based licensing system and/or performance-based program approval system. NCATE conducts the review of the unit and considers the performance of the institution's candidates throughout their preparation and of its graduates on licensing assessments.</p>	
<p>ALASKA, <i>JOINT team*</i> ARKANSAS, <i>NCATE team*</i> COLORADO, <i>TWO teams</i> CONNECTICUT, <i>JOINT team</i> DELAWARE, <i>TWO teams</i> HAWAII, <i>NCATE team</i> ILLINOIS, <i>JOINT team</i> LOUISIANA, <i>JOINT team</i> MARYLAND, <i>JOINT team*</i> MASSACHUSETTS, <i>JOINT team</i> MISSISSIPPI, <i>JOINT team**</i> NEVADA, <i>JOINT team</i> NEW YORK, <i>JOINT team</i> PENNSYLVANIA, <i>TWO teams</i> PUERTO RICO, <i>JOINT team</i> RHODE ISLAND, <i>TWO teams</i> SO. CAROLINA, <i>JOINT team**</i> TEXAS, <i>JOINT team</i> VIRGINIA, <i>JOINT team</i> WEST VIRGINIA, <i>JOINT team**</i></p>		<p>ALABAMA, <i>TWO teams</i> DISTRICT OF COLUMBIA, <i>TWO teams</i> GEORGIA, <i>TWO teams**</i> IDAHO, <i>TWO teams</i> IOWA, <i>TWO teams</i> KANSAS, <i>JOINT team</i> MAINE, <i>JOINT team</i> MICHIGAN, <i>TWO teams</i> MINNESOTA, <i>TWO teams</i> MISSOURI, <i>TWO teams</i> MONTANA, <i>TWO teams</i> NEBRASKA, <i>JOINT team</i> NEW MEXICO, <i>JOINT team</i> NO. CAROLINA, <i>TWO teams*</i> NORTH DAKOTA, <i>JOINT team</i> OHIO, <i>NCATE team</i> OKLAHOMA, <i>JOINT team</i> OREGON, <i>TWO teams</i> SOUTH DAKOTA, <i>TWO teams</i> TENNESSEE, <i>TWO teams, JOINT teams for continuing visits</i> UTAH, <i>TWO teams</i> WASHINGTON, <i>TWO teams</i> WISCONSIN, <i>TWO teams</i> WYOMING, <i>TWO teams</i></p>		<p>CALIFORNIA, <i>JOINT team</i> INDIANA, <i>JOINT team</i> KENTUCKY, <i>JOINT team</i> FLORIDA, <i>JOINT team</i></p> <p><i>*NCATE Accred. Required of ALL institutions (NC requires initial accred. only)</i> <i>**NCATE Accred. Required of PUBLIC institutions</i></p> <p><i>NCATE team: Only NCATE Board of Examiners (BOE)</i> <i>JOINT team: BOE and State team</i> <i>TWO teams: Two concurrent teams- NCATE BOE team and separate State team</i></p>	

Introduction to the Standards

The ITEA/CTTE/NCATE standards were rewritten by the CTTE Accreditation Committee and submitted to NCATE for approval in October of 2003. The following curriculum standards have been reviewed extensively by the technology teacher education profession over the past several years. The ITEA/CTTE/NCATE standards are a result of several projects including:

1. The Professional Development Standards, part of International Technology Education Association's Technology for All Americans Project.
2. The 1997 ITEA/CTTE/NCATE guidelines approved by NCATE.
3. The INTASC Standards.
4. The Standards for Technological Literacy, part of International Technology Education Association's Technology for All Americans Project.
5. The suggested format for standards by NCATE using knowledge, performance, and disposition indicators. (NCATE Professional Standards for the Accreditation of School, Colleges, and Departments of Education, 2002 Edition).

Description of the Standards

Types of Standards

There are ten standards. The ten standards are subdivided into two sets as shown below:

Subject Matter Standards for Technology Education

- Standard 1—The Nature of Technology
- Standard 2—Technology and Society
- Standard 3—Design
- Standard 4—Abilities for a Technological World
- Standard 5—The Designed World

Effective Teaching Standards for Technology Education

- Standard 6—Curriculum
- Standard 7—Instructional Strategies
- Standard 8—Learning Environment
- Standard 9—Students
- Standard 10—Professional Growth

Standards 1-5 of this document specifically focus on the subject matter of technology. For more detailed descriptions of standards 1-5, refer to the *Standards for Technological Literacy: Content for the Study of Technology* (ITEA, 2000). Standards 6-10 identify the knowledge necessary for effective teaching of technology in technology teacher education programs. For more detailed descriptions of standards 6-10 refer to the *Professional Development Standards* (ITEA 2003). Both of these documents are part of the Technology for All Americans Project.

The Designed World

The document *Standards for Technological Literacy: Content for the Study of Technology* includes an area entitled “The Designed World.” This content (medical, agricultural/biotechnologies, energy, communication, transportation, construction, and manufacturing technologies) has also been included as an ITEA/CTTE/NCATE subject matter standard (standard 5). It should be noted that in addition to standard 5, The Designed World content should also be evident in all of the subject matter standards 1-4. For example, when teaching and learning occurs in any of the subject matter content standards 1-4, it should be learned in the context of medical, agricultural/biotechnology, energy, communication, transportation, construction, and/or manufacturing technologies. It is not necessary to have courses in each of these areas. However, there should be ample evidence included that shows all of these areas are being covered within a variety of courses in the technology teacher education program.

Indicators

Each of the ten standards are further described and explained by including outcome statements that are called “**indicators.**” The “indicators” are statements that further define the standard. They help to show the depth and breadth of the standard and give examples as to the type of topics that are components of the standard.

To provide technology teacher education candidates with comprehensive learning opportunities, there are knowledge, performance and disposition indicators included with each standard. **Knowledge indicators** are those that focus on cognitive information such as concepts, theories, ideas, formulas, definitions, identifications and analyses about the standard. **Performance indicators** are those that focus on physical outcomes, applications of learning, and the ability to use content concerning the standard. **Disposition indicators** are those that concentrate on attitudes, values, ethics, beliefs, and affective behaviors about the standard. **It is important to remember that when writing a program report, it is not necessary to respond to each and every indicator. The program report and supporting documentation should be prepared to show that the overall standard has been met.** However, mastery of indicators will lead to more complete achievement of each standard.

In addition to the indicators, a section has been included called “examples of evidence.” These are suggested examples about the indicators that the program report writer should consider when selecting performance evidence to show that the standard is being met by the technology teacher education program candidates.

The Program Report Assessment Process

When being reviewed by program report reviewers, each standard will be evaluated based on the performance evidence submitted. Evidence will be judged target, acceptable, or unacceptable based on the rubric provided for each standard.

For **Subject Matter** Standards 1-5, target, acceptable, or unacceptable judgments are defined as:

Target—Technology teacher education candidates have in-depth knowledge of the subject matter that they plan to teach as described in the standard and they demonstrate their knowledge through inquiry, critical analysis, and evaluation of the subject matter.

Acceptable—Technology teacher education candidates know the subject matter that they plan to teach and can explain important principles and concepts delineated in the standard.

Unacceptable—Technology teacher education candidates have inadequate knowledge of the subject matter that they plan to teach and are unable to provide examples of important principles or concepts identified as part of the standard.

For **Effective Teaching** Standards 6-10, target, acceptable, or unacceptable judgments are defined as:

Target—Technology teacher education candidates demonstrate a thorough understanding of effective teaching content identified in the standards in a way that allows them to provide multiple explanations and effective teaching decisions to maximize student learning of the subject matter standard.

Acceptable—Technology teacher education candidates have a broad knowledge of effective teaching content as identified in the standard that can incorporate the subject matter content in a way that helps them develop quality-learning experiences for all students.

Unacceptable—Technology teacher education candidates do not understand the relationship of content and effective teaching identified in the standard in a way that helps them develop learning experiences that integrates all the areas of technological subject matter.

Completing the Overview and Scope Section

When preparing a program report, all items listed under the title, “Overview and Scope,” must be included in the overview section. **The standards for program report preparation limit the overview section to no more than 12 pages, and must cover all of the 10 items listed on the cover sheet.** It is imperative to be well organized and concise when preparing and editing this section. Some specific suggestions follow.

1. **Mission, goals, and objectives.** This section should include the technology teacher education program mission statement, goals and objectives that reflect the definition of technology and technology education suggested by ITEA, and the *Standards for Technological Literacy: Content for the Study of Technology*. The mission statement should articulate with the overall mission of the teacher education unit and curriculum structure. It should be a narrative, and a paragraph or two in length. It should focus on the technology teacher education program, not the department, if the department

houses more than the technology teacher education program. Specifically state what the mission of the technology teacher education program is. Describe why the technology teacher education program exists, i.e. the preparation of technology teacher education candidates for schools that exist in a dynamic technological society.

Program goals should state how the mission of the technology teacher education program will be achieved. When preparing program goals, also refer to the goals of the education unit, (i.e., college of education, and articulate program goals with the unit's goals). Review current educational literature on the general goals of teacher preparation to assist with the preparation of program goals. In addition, current technology education literature should be reviewed to provide direction in establishing program goals. These should be directed at technology teacher education program preparation and focus on such things as knowledge of the technology education field, pedagogical methods, curricular content, learner development and styles, operations of the laboratory-classroom and school, technological values, and program implementation strategies.

Program objectives should be more specific statements that include actions to ensure attainment of program goals. As program goals and objectives are established, they should be addressed through the courses that make up the technology teacher education program of study.

2. **Program of study.** Include an example of student program of study with all required courses clearly marked, including exact courses and sequence taken by semester. Begin this section with a narrative describing any admissions, continuance status, and graduation requirements of the university, college, or technology teacher education program. This might mean that a student is required to complete a number of courses or semesters before he/she can matriculate or major in the technology teacher education program, or that a minimum grade point average must be attained before admission, that letters of recommendation or interviews are required, or students must pass a speech or hearing test.

Include grade point average expectations or other requirements for continuance in the technology teacher education program, as well as exit requirements that the student must complete to meet university, college, or program clearance and graduation and certification. These might include a writing examination or university, college and/or technology teacher education program academic assessment tests. Many states also require the completion of the National Teachers Examination or PRAXIS, and a first year teacher assessment prior to certification.

This narrative section should be followed by a program of study sheet that lists courses required for completion of the technology teacher education program. It is suggested that the course of studies (concentration sheet) be developed with suggested university general education courses and electives that support the total technology teacher education program. If specific science, mathematics, social science, and humanities courses are recommended for the technology teacher

education program, for example, these should be highlighted. Also, list academic technical requirements, technical electives and academic professional education courses required for the major. The listing of technical courses should be organized around the content suggested in the *Standards for Technological Literacy: Content for the Study of Technology*.

Finally, the program of study sheet should specify professional courses taught by the college or department and required for teacher preparation in technology teacher education program. Include the recommended sequence of courses that teacher candidates should take semester by semester. This course pattern should include general education, technology, academic, technical, and professional education courses that a typical teacher candidate would take to complete a technology teacher education program.

3. **Field experiences.** In this section, describe all technology teacher education program clinical and field experiences, when and where they occur in the program, the purpose of each experience, and the duration of each. For student teaching especially, describe how technology teacher education program sites are selected, how master/cooperative teachers are selected and trained, how the program is monitored by the technology teacher education preparation program, the school(s) where the student teachers are placed, and how the experience is evaluated.
4. **Explanation of deviations from standards.** If the technology teacher education program deviates from the ITEA/CTTE/NCATE standards, provide a carefully constructed statement of justification. For example, if a state department of education has production technology rather than construction and manufacturing as a major content organizer, that fact should appear in this section.
5. **Description of program location.** Provide both a written description and a graphic diagram of the placement of the technology teacher education program in the institution. The graphic should show the relationship of the technology teacher education program to other university programs, departments, colleges, or schools that are involved in the preparation of technology teacher education candidates. Explain where the technology teacher education courses are offered, the number of faculty and students in the department; and the number of each that are in technology teacher education program. The relationship between the technology teacher education program and the institutional unit, councils, or committees that govern or direct teacher preparation should be included.
6. **Faculty.** In this section, list the names of tenure-track faculty, instructors, adjunct faculty and graduate teaching assistants who teach required courses in the technology teacher education program. List the department chair/program leader, full-time faculty, and part-time/adjunct faculty/teaching assistants in that order. Include their highest degrees, rank, tenure status, and courses taught for the year of review. Also indicate their membership in ITEA, CTTE, state organizations and other professional organizations. Do not send faculty vita.

7. **Number of graduates.** Provide a table of the number of technology teacher education candidates who have received the bachelor's degree from the program during the past five (5) years. Also, list bachelor's degree graduates from other technology-related programs that are offered by the department. In the table, indicate their initial placements, such as teaching, industry and other (e.g., military, graduate school). In addition to the table, also describe the number of students enrolled in the technology teacher education program and the types of teaching positions the candidates are receiving upon graduation. Describe enrollment trends for the technology teacher education program. **Do not list graduates from master's, educational specialist or doctoral programs unless they are for initial licensure.**
8. **Program funding.** Describe the appropriateness of funding for the technology teacher education program. Describe adequacy of budgets for consumable supplies, new equipment purchases, faculty development, travel, secretarial support, personal computers, library acquisitions, and other areas. Provide an overview of budget trends for the last five (5) years.
9. **Program facilities.** Describe how equipment and facilities have been modernized to accommodate the technology teacher education program. The focus should be on the technology teacher education program, not engineering, industrial technology or other related programs.
10. **State certification requirements.** Include a copy of the state certification or licensure requirements for technology teacher education in this section. If state requirements differ substantially from ITEA/CTTE/NCATE curriculum standards, indicate how state standards can be met within ITEA/CTTE/NCATE standards. Also indicate if state standards or ITEA/CTTE/NCATE standards are used.

Suggestions for Writing a Program Report

The following is a list of suggestions that will help the program report writer.

1. Before writing the program report to be submitted, it is suggested that the faculty from the technology teacher education program collect various assessments showing a variety of technology teacher education candidate performances for each standard at least one year before beginning to write the program report.
2. When addressing each standard, refer to the indicators and examples of evidence in the rubric. Using the assessments collected from the students, identify how the technology teacher education program meets each standard by writing the "explanation section" as part of each standard and include appendices for support.
3. The entire program report should have page numbers from the beginning to the end. The entire report should not exceed 140 pages.

4. When referring to an appendix or a part of an appendix in the explanation section, always reference the appendix with page numbers. For example, see Appendix A, Section V, page 1.
5. When selecting examples of evidence that illustrate if the technology teacher education program candidates have achieved a particular standard, consider including examples of student assignments, portfolio entries, student-authored lesson plans and units of instruction, student presentations, university, state or national test results, student reports, student journals, results of observations, for “assessment materials” that are related to the three indicators of candidate knowledge, performance, and dispositions. Remember that the emphasis on the new standards is on performance data.
6. It is not necessary to show evidence that each and every indicator is being met. In fact, an appendix that has been included may relate to several indicators in one or more standard. Remember to write to the standards, not its individual indicators. Thus, it is very important to select the best and most comprehensive student performance evidence possible.
7. It is suggested that approximately 2-4 pages of explanation and 8-10 pages of student evidence materials (in the appendices) be included to show how the technology teacher education program candidates meets each standard.
8. Program reports should be bound on the left side. It is suggested that plastic bindings be used, which allows the program reports to be fully opened for easy review. The use of three-ring notebooks is strongly discouraged. Use tabs for the major sections and subsections of the program report so that information can be easily located. The following is an example of titles for tabs.
 - Tab I—Overview and Scope Section
 - Tab II to Tab XI—Explanation section for each of the Ten Standards
 - Tab XII-Tab XX—Student Evidence Appendices

Submission of the Program Report

After approval by all institutional authorities and the college unit, four (4) copies of the curriculum program report must be sent to NCATE as part of the institution’s precondition package. Refer to **Table 1** on page 5 of this document for a timeline in which program reports must be submitted to NCATE through the college unit.

Continuing Program Approval

ITEA and CTTE believe that program review is a continual process. As such, procedures are in place for an interim five-year review for technology teacher education programs that have program approval through the ITEA/CTTE/NCATE approval process. The goal of the interim five-year review is to assure that technology teacher education program is continually assessing their performance and making appropriate changes. The college unit is notified by NCATE that the technology teacher education program needs to submit the interim five-year review. It is the college's responsibility to notify faculty in the technology teacher education program of the forthcoming review at least 12-18 months before the report is due to NCATE.

For the interim five-year review, the institution, through the technology teacher education program, submits a report addressing the following questions.

1. Describe the progress toward addressing each specific standard found to be “not met” or not addressed during the last program report review.
2. Describe progress toward addressing each weakness/recommendation noted during the last program report review.
3. Describe changes in the technology teacher education program since the last program report review and explain how those changes might impact program approval with the ITEA/CTTE standards.
4. Describe institutional/programmatic circumstances or special considerations that were or were not included in the initial program report review, which might help the program report reviewers better understand the technology teacher education program.
5. Describe changes in resources such as faculty, technology, and facilities and explain how these changes have impacted the technology teacher education program.
6. Describe added faculty resources, new emphasis, or areas of study in the development of the technology teacher education program since the last program report review.

COVER SHEET
TECHNOLOGY TEACHER EDUCATION/INITIAL PROGRAM
**International Technology Education Association/
Council on Technology Teacher Education**

Please include one copy of this cover sheet with each program report.

SUBMITTED BY: _____
(Name of College/University)

(Address)

CHIEF COMPILER: _____

DATE: _____ PHONE: _____

DATE OF ON-SITE VISIT: _____

Name of program offered for review in this document: _____

Classification: _____ Level(s) offered for review in this document: _____

- _____ Administration
- _____ Pre-School/Pre K
- _____ K-12 Education
- _____ Kindergarten
- _____ Early Childhood
- _____ Elementary Education
- _____ Middle School Education
- _____ Secondary Education
- _____ Combined (specify): _____
- _____ Support Services
- _____ Other (specify): _____

- _____ Baccalaureate
- _____ Post-Baccalaureate, Initial Program
- _____ Masters, Initial Program
- _____ Other (specify): _____

Checklist of materials included with this program review document (No more than 12 pages):

Section I Overview and Scope *(Please refer to page 13 for more information on each item.)*

- _____ (1) Mission, goals and objectives.
- _____ (2) Program four-year course of study including exact courses and sequence taken by semester.
- _____ (3) Descriptions of field experiences, student teaching and internships (must be in a technology education program). Include the amount of time and the type of supervision.
- _____ (4) Explanation of how the program may deviate from the ITEA/CTTE/NCATE program standards.
- _____ (5) Descriptions of where the program is located within the professional

education unit and its interrelationships with other programs in the unit and the university/college.

- _____ (6) List of faculty with primary assignments in the technology teacher education programs. Provide rank, responsibilities and tenure status. (Do not send faculty vita.)
- _____ (7) Number of graduates from the initial technology teacher education program over the past five (5) years.
- _____ (8) Description of program funding for the last five (5) years.
- _____ (9) Description of program facilities.
- _____ (10) State certification/licensure requirements for the technology teacher education.

Section II Ten (10) Standards and Associated Indicators. *(Please complete an "explanation" section for each of the 10 standards.)*

Section III Performance Evidence/Appendices

When providing evidence, NCATE encourages the use of teacher candidate performance-based evidence, such as portfolio entries, student assignments, student journals, results of observations, classroom and/or program assessment results, evaluations by faculty, success on state licensure exams or other national/state tests, or other performance evidence as necessary.

I verify that the information provided in this program review document is accurate and true:

Signature

Name (please print)

Position

Telephone

Address:

STANDARD 1 — THE NATURE OF TECHNOLOGY

Technology teacher education program candidates develop an understanding of the nature of technology within the context of the *Designed World*.

INDICATORS:

The following knowledge, performance, and disposition indicators provide guidance to better understand the scope of Standard 1.

The program prepares technology teacher education candidates who can:

Knowledge Indicators:

- Explain the characteristics and scope of technology.
- Compare the relationship among technologies and the connections between technology and other disciplines.

Performance Indicators:

- Apply the concepts and principles of technology when teaching technology in the classroom and laboratory.

Disposition Indicators:

- Comprehend the nature of technology in a way that demonstrates sensitivity to the positive and negative aspects of technology in our world.

RUBRIC FOR STANDARD 1-The Nature of Technology

Based upon the explanations and examples of teacher candidate work submitted for Standard 1, an informed judgment will be made using the rubric below.

TARGET

Technology teacher education program candidates have in-depth knowledge of the subject matter that they plan to teach as described in the standard and they demonstrate their knowledge through inquiry, critical analysis and evaluation of the subject matter.

ACCEPTABLE

Technology teacher education program candidates know the subject matter that they plan to teach and can explain important principles and concepts delineated in the standard.

UNACCEPTABLE

Technology teacher education program candidates have inadequate knowledge of the subject matter that they plan to teach and are unable to provide examples of important principles or concepts identified as part of the standard.

Knowledge Indicators:

- Explain the characteristics and scope of technology.
- Compare the relationship among technologies and the connections between technology and other disciplines.

Examples of evidence may include the rate of technological change, commercialization of technology, product demand, development of technology, technology transfer, innovation and invention, advances in science and mathematics, interrelationship between technology and environment, knowledge from other fields of study and technology.

Performance Indicators:

- Apply the concepts and principles of technology when teaching technology in the classroom and laboratory.

Examples of evidence may include the systems, resources, requirements, processes, controls, feedback, trade-offs.

Disposition Indicators:

- Comprehend the nature of technology in a way that demonstrates sensitivity to the positive and negative aspects of technology in our world.

Examples of evidence may include creativity in technology, advantages and disadvantages of technology development.

Explanation: In the space below, and by including appendices, explain how your technology teacher education candidates meet Standard 1 by describing appropriate assessment materials and student experiences related to the indicators above. Add as much text as needed by expanding the space below.

STANDARD 2 — TECHNOLOGY AND SOCIETY

Technology teacher education program candidates develop an understanding of technology and society within the context of the *Designed World*.

INDICATORS:

The following knowledge, performance, and disposition indicators provide guidance to better understand the scope of Standard 2.

The program prepares technology teacher education candidates who can:

Knowledge Indicators:

- Compare the relationships between technology and social, cultural, political, and economic systems.
- Assess the role of society in the development and use of technology.
- Assess the importance of significant technological innovations on the history of human kind.

Performance Indicators:

- Judge the effects of technology on the environment.
- Evaluate the relationship between technology and social institutions such as family, religion, education, government, and workforce.

Disposition Indicators:

- Demonstrate sensitivity to appropriate and inappropriate uses of technology and its effects on society and the environment.
- Make decisions based on knowledge of intended and unintended effects of technology on society and the environment.

RUBRIC FOR STANDARD 2-Technology and Society

Based upon the explanations and examples of teacher candidate work submitted for Standard 2, an informed judgment will be made using the rubric below.

TARGET

Technology teacher education program candidates have in-depth knowledge of the subject matter that they plan to teach as described in the standard and they demonstrate their knowledge through inquiry, critical analysis and evaluation of the subject matter.

ACCEPTABLE

Technology teacher education program candidates know the subject matter that they plan to teach and can explain important principles and concepts delineated in the standard.

UNACCEPTABLE

Technology teacher education program candidates have inadequate knowledge of the subject matter that they plan to teach and are unable to provide examples of important principles or concepts identified as part of the standard.

Knowledge Indicators:

- **Compare the relationships between technology and social, cultural, political, and economic systems.**
- **Assess the role of society in the development and use of technology.**
- **Assess the importance of significant technological innovations on the history of human kind.**
Examples of evidence may include trade-offs due to technology, ethical implications, social, cultural, political and economic changes due to technology, historical timelines of technological developments, and evolution of technology.

Performance Indicators:

- **Judge the effects of technology on the environment.**
- **Evaluate the relationship between technology and social institutions such as family, religion, education, government, and workforce.**
Examples of evidence may include conservation, reducing resource use, recycling, relationship of natural resources to technological development, and assignments that show how technology interrelates to various social institutions such as family, work, education.

Disposition Indicators:

- **Demonstrate sensitivity to appropriate and inappropriate uses of technology and its effects on society and the environment.**
- **Make decisions based on knowledge of intended and unintended effects of technology on society and the environment.**
Examples of evidence may include ethical issues dealing with technology, environmental damage, and how one values relate to technological development.

Explanation: In the space below, and by including appendices, explain how your technology teacher education candidates meet Standard 2 by describing appropriate assessment materials and student experiences related to the indicators above. Add as much text as needed by expanding the space below.

STANDARD 3 — DESIGN

Technology teacher education program candidates develop an understanding of design within the context of the *Designed World*.

INDICATORS:

The following knowledge, performance, and disposition indicators provide guidance to better understand the scope of Standard 3.

The program prepares technology teacher education candidates who can:

Knowledge Indicators:

- Explain the importance of design in the human-made world.
- Describe the attributes of design.
- Analyze the engineering design process and principles.

Performance Indicators:

- Apply the process of troubleshooting, research and development, invention, innovation, and experimentation in developing solutions to a design problem.

Disposition Indicators:

- Investigate the relationship between designing a product and the impact of the product on the environment, economy, and society.

RUBRIC FOR STANDARD 3-Design

Based upon the explanations and examples of student work submitted for Standard 3, an informed judgment will be made using the rubric below.

TARGET

Technology teacher education program candidates have in-depth knowledge of the subject matter that they plan to teach as described in the standard and they demonstrate their knowledge through inquiry, critical analysis and evaluation of the subject matter.

ACCEPTABLE

Technology teacher education program candidates know the subject matter that they plan to teach and can explain important principles and concepts delineated in the standard.

UNACCEPTABLE

Technology teacher education program candidates have inadequate knowledge of the subject matter that they plan to teach and are unable to provide examples of important principles or concepts identified as part of the standard.

Knowledge Indicators:

- **Explain the importance of design in the human-made world.**
- **Describe the attributes of design.**
- **Analyze the engineering design process and principles.**
Examples of evidence may include the definition of design, requirements of design, the engineering design process, and how design helps to solve problems and create opportunities in society.

Performance Indicators:

- **Apply the process of troubleshooting, research and development, invention, innovation, and experimentation in developing a solution to a design problem.**
Examples of evidence may include modeling, testing, evaluating and modifying designs, invention and innovation, design principles, prototyping, research and development, troubleshooting.

Disposition Indicators:

- **Investigate the relationship between designing a product and the impact of the product on the environment, economy, and society.**
Examples of evidence may include impacts and implications of products used in society, environment and economy, maintenance of products after design, and products that have little need in society.

Explanation: In the space below, and by including appendices, explain how your technology teacher education candidates meet Standard 3 by describing appropriate assessment materials and student experiences related to the indicators above. Add as much text as needed by expanding the space below.

STANDARD 4 — ABILITIES FOR A TECHNOLOGICAL WORLD

Technology teacher education program candidates develop abilities for a technological world within the contexts of the *Designed World*.

INDICATORS:

The following knowledge, performance, and disposition indicators provide guidance to better understand the scope of Standard 4.

The program prepares technology teacher education candidates who can:

Knowledge Indicators:

- Select design problems and include appropriate criteria and constraints for each problem.
- Evaluate a design, assessing the success of a design solution, and develop proposals for design improvements.
- Analyze a designed product, and identify the key components of how it works and how it was made.
- Operate and maintain technological products and systems.

Performance Indicators:

- Develop and model a design solution.
- Complete an assessment to evaluate merits of design solution.
- Operate a technological device and/or system.
- Diagnose a malfunctioning system, restore the system, and maintain the system.
- Investigate the impacts of products and systems on individuals, the environment, and society.

Disposition Indicators:

- Assess the impacts of products and systems.
- Follow safe practices and procedures in the use of tools and equipment.
- Judge the relative strengths and weaknesses of a designed product from a consumer perspective.
- Exhibit respect by properly applying tools and equipment to the processes for which they were designed.
- Design and use instructional activities that emphasized solving real world open-ended problems.

RUBRIC FOR STANDARD 4-Abilities for a Technological World

Based upon the explanations and examples of student work submitted for Standard 4, an informed judgment will be made using the rubric below.

TARGET

Technology teacher education program candidates have in-depth knowledge of the subject matter that they plan to teach as described in the standard and they demonstrate their knowledge through inquiry, critical analysis and evaluation of the subject matter.

ACCEPTABLE

Technology teacher education program candidates know the subject matter that they plan to teach and can explain important principles and concepts delineated in the standard.

UNACCEPTABLE

Technology teacher education program candidates have inadequate knowledge of the subject matter that they plan to teach and are unable to provide examples of important principles or concepts identified as part of the standard.

Knowledge Indicators:

- **Select design problems and include appropriate criteria and constraints for each problem.**
- **Evaluate a design, assessing the success of a design solution, and develop proposals for design improvements.**
- **Analyze a designed product, and identify the key components of how it works and how it was made.**
- **Operate and maintain technological products and systems.**
Examples of evidence may include processes for solving human problems, identifying design criteria/constraints, assessing a designed product and how it works, using and maintaining technological tools and materials.

Performance Indicators:

- **Develop and model a design solution.**
- **Complete an assessment to evaluate merits of design solution.**
- **Operate a technological device and/or system.**
- **Diagnose a malfunctioning system, restore the system, and maintain the system.**
- **Investigate the impacts of products and systems on individuals, the environment, and society.**
Examples of evidence may include the process of creating a design solution, testing and evaluating design solutions, modeling a design solution, monitoring and modifying a design, and diagnosing, adjusting and repairing of a malfunctioning system.

Disposition Indicators:

- **Assess the impacts of products and systems.**
- **Follow safe practices and procedures in the use of tools and equipment.**
- **Judge the relative strengths and weaknesses of a designed product from a consumer perspective.**
- **Exhibit respect by properly applying tools and equipment to the processes for which they were designed.**
- **Design and use instructional activities that emphasized solving real open-ended problems.**
Examples of evidence may include safe utilization of tools and equipment in the laboratory, determining impacts of designed products, determining if products are usable in society, using correct tools/equipment in the laboratory.

Explanation: In the space below, and by including appendices, explain how your technology teacher education candidates meet Standard 4 by describing appropriate assessment materials and student experiences related to the indicators above. Add as much text as needed by expanding the space below.

STANDARD 5 — THE DESIGNED WORLD

Technology teacher education program candidates develop an understanding of the *Designed World*.

INDICATORS:

The following knowledge, performance, and disposition indicators provide guidance to better understand the scope of Standard 5.

The program prepares technology teacher education candidates who can:

Knowledge Indicators:

- Analyze the principles of various medical technologies as part of the designed world.
- Analyze the principles of various agricultural and related biotechnologies as part of the designed world.
- Analyze the principles, concepts and applications of energy and power technologies as part of the designed world.
- Analyze the principles, concepts and applications of information and communication technologies as part of the designed world.
- Analyze the principles of various transportation technologies that are part of the designed world.
- Analyze the principles, concepts, and applications of manufacturing technologies as part of the designed world.
- Analyze the principles, concepts, and applications of construction technologies as part of the designed world.

Performance Indicators:

- Select and use appropriate technologies in a variety of contexts including medical, agricultural and related biotechnologies, energy and power applications, information and communications, transportation, manufacturing, and construction.

Disposition Indicators:

- Effectively use and improve technology in a variety of contexts including medical, agricultural and related biotechnologies, energy and power applications, information and communications, transportation, manufacturing, and construction.

RUBRIC FOR STANDARD 5-The Designed World

Based upon the explanations and examples of student work submitted for Standard 5, an informed judgment will be made using the rubric below.

TARGET

Technology teacher education program candidates have in-depth knowledge of the subject matter that they plan to teach as described in the standard and they demonstrate their knowledge through inquiry, critical analysis and evaluation of the subject matter.

ACCEPTABLE

Technology teacher education program candidates know the subject matter that they plan to teach and can explain important principles and concepts delineated in the standard.

UNACCEPTABLE

Technology teacher education program candidates have inadequate knowledge of the subject matter that they plan to teach and are unable to provide examples of important principles or concepts identified as part of the standard.

Knowledge Indicators:

- Analyze the principles of various medical technologies as part of the designed world.
- Analyze the principles of various agricultural and related biotechnologies as part of the designed world.
- Analyze the principles, concepts and applications of energy and power technologies as part of the designed world.
- Analyze the principles, concepts and applications of information and communication technologies as part of the designed world.
- Analyze the principles of various transportation technologies that are part of the designed world.
- Analyze the principles, concepts, and applications of manufacturing technologies as part of the designed world.
- Analyze the principles, concepts, and applications of construction technologies as part of the designed world.
Examples of evidence may include medical technology applications, biotechnology and agricultural technology advances, laws of energy conservation and energy resources, efficiency of power systems, communications technology systems such as encoding, transmitting, and receiving information, transportation technologies (land, marine, atmospheric space), manufacturing system advances, construction processes and procedures.

Performance Indicators:

- Select and use appropriate technologies in a variety of contexts including medical, agricultural and related biotechnologies, energy and power applications, information and communications, transportation, manufacturing, and construction.
Examples of evidence may include designing and using products and systems in medical, agricultural, biotechnology, energy and power, communications, transportation, manufacturing, and construction technologies.

Disposition Indicators:

- Effectively use and improve technology in a variety of contexts including medical, agricultural and related biotechnologies, energy and power applications, information and communications, transportation, manufacturing, and construction.
Examples of evidence may include the analysis and evaluation of products and systems in medical agricultural, biotechnology, energy and power, communications, transportation, manufacturing, and construction technologies.

Explanation: In the space below, and by including appendices, explain how your technology teacher education candidates meet Standard 5 by describing appropriate assessment materials and student experiences related to the indicators above. Add as much text as needed by expanding the space below.

STANDARD 6 — CURRICULUM

Technology teacher education program candidates design, implement, and evaluate curricula based upon Standards for Technological Literacy.

INDICATORS:

The following knowledge, performance, and disposition indicators provide guidance to better understand the scope of Standard 6.

The program prepares technology teacher education candidates who can:

Knowledge Indicators:

- Identify appropriate content for the study of technology at different grade levels.
- Integrate technological curriculum content from other fields of study.
- Identify curriculum and instructional materials and resources that enable effective delivery when teaching about technology.

Performance Indicators:

- Engage in long-term planning that results in an articulated curriculum based on Standards for Technological Literacy for grades K-12 or equivalent.
- Design technology curricula and programs that integrate content from other fields of study.
- Improve the technology curriculum by making informed decisions using multiple sources of information.
- Incorporate up-to-date technological developments into the technology curriculum.
- Implement a technology curriculum that systemically expands the technological capabilities of the student.

Disposition Indicators:

- Demonstrate sensitivity to cultural, ethnic diversity, special needs, interest, abilities, and gender issues when selecting, designing, or evaluating curriculum and instructional materials.

RUBRIC FOR STANDARD 6-Curriculum

Based upon the explanations and examples of student work submitted for Standard 6, an informed judgment will be made using the rubric below.

TARGET

Technology teacher education program candidates demonstrate a thorough understanding of effective teaching content identified in the standard in a way that allows them to provide multiple explanations and effective teaching decisions to maximize student learning of the subject matter standard.

ACCEPTABLE

Technology teacher education program candidates have a broad knowledge of effective teaching content as identified in the standard that can incorporate the subject matter content in a way that helps them develop quality-learning experiences for all students.

UNACCEPTABLE

Technology teacher education program candidates do not understand the relationship of content and effective teaching identified in the standard in a way that helps them develop learning experiences that integrates all the areas of technological subject matter.

Knowledge Indicators:

- Identify appropriate content for the study of technology at different grade levels.
- Integrate technological content from other fields of study.
- Identify curriculum and instructional materials that enable effective delivery when teaching about technology.

Examples of evidence may include developing a curriculum that shows the relationship between technology and other disciplines, use of appropriate instructional materials to enhance the delivery of technology content.

Performance Indicators:

- Engage in long-term planning that results in an articulated curriculum based on Standards for Technological Literacy for grades K-12 or equivalent.
- Design technology curricula and programs that integrate content from other fields of study.
- Improve the technology curriculum by making informed decisions using multiple sources of information.
- Incorporate up-to-date technological developments into the technology curriculum.
- Implement a technology curriculum that systemically expands the technological capabilities of the student.

Examples of evidence may include designing interdisciplinary and articulated technology curricula, getting input from the stakeholders, business, industry, and other leaders, developing a technologically up-to-date curriculum, designing a curriculum that builds upon the students technological background, and designing curriculum that uses a variety of sources for gathering information.

Disposition Indicators:

- Demonstrate sensitivity to cultural and ethnic diversity and gender issues when selecting, developing, and evaluating curriculum and instructional materials.

Examples of evidence may include designing technology curricula and the instructional materials that are sensitive to cultural diversity and gender issues in the study of technology.

Explanation: In the space below, and by including appendices, explain how your technology teacher education candidates meet Standard 6 by describing appropriate assessment materials and student experiences related to the indicators above. Add as much text as needed by expanding the space below.

STANDARD 7 — INSTRUCTIONAL STRATEGIES

Technology teacher education program candidates use a variety of effective teaching practices that enhance and extend learning of technology.

INDICATORS:

The following knowledge, performance, and disposition indicators provide guidance to better understand the scope of Standard 7.

The program prepares technology teacher education candidates who can:

Knowledge Indicators:

- Base instruction on contemporary teaching strategies that are consistent with Standards for Technological Literacy.
- Apply principles of learning and consideration of student diversity to the delivery of instruction.
- Compare a variety of instructional strategies to maximize student learning about technology.
- Describe a variety of student assessments appropriate for different instructional materials.

Performance Indicators:

- Apply appropriate materials, tools, equipment, and processes to enhance student learning about technology.
- Assess instructional strategies to improve teaching and learning in the technology classroom by using self-reflection, student learning outcomes, and other assessment techniques.

Disposition Indicators:

- Exhibit an enthusiasm for teaching technology by creating meaningful and challenging technology learning experiences that lead to positive student attitudes toward the study of technology.

RUBRIC FOR STANDARD 7-Instructional Strategies

Based upon the explanations and examples of student work submitted for Standard 7, an informed judgment will be made using the rubric below.

TARGET

Technology teacher education program candidates demonstrate a thorough understanding of effective teaching content identified in the standard in a way that allows them to provide multiple explanations and effective teaching decisions to maximize student learning of the subject matter standard.

ACCEPTABLE

Technology teacher education program candidates have a broad knowledge of effective teaching content as identified in the standard that can incorporate the subject matter content in a way that helps them develop quality-learning experiences for all students.

UNACCEPTABLE

Technology teacher education program candidates do not understand the relationship of content and effective teaching identified in the standard in a way that helps them develop learning experiences that integrates all the areas of technological subject matter.

Knowledge Indicators:

- **Base instruction on contemporary teaching strategies that is consistent with Standards for Technological Literacy.**
- **Apply principles of learning and consideration of student diversity to the delivery of instruction.**
- **Compare a variety of instructional strategies to maximize student learning about technology.**
- **Describe a variety of student assessments appropriate for different instructional materials.**
Examples of evidence may include the selection of various instructional strategies including cooperative learning, guided practice, modeling, conceptual learning, simulation, games, inquiry, problem solving that best fit the technology content being studied, and how instructional strategies and learning theory change with student differences.

Performance Indicators:

- **Apply appropriate materials, tools, equipment, and processes to enhance student learning about technology.**
- **Assess instructional strategies to improve teaching and learning in the technology classroom by using self-reflection, student learning outcomes, and other assessment techniques.**
Examples of evidence may include appropriate laboratory and classroom development (design of the laboratory, tools, equipment, materials, etc.) that can enhance technological learning, and assessment of instructional strategies that measure and monitor teaching effectiveness and student learning.

Disposition Indicators:

- **Exhibit an enthusiasm for teaching technology by creating meaningful and challenging technology learning experiences that lead to positive student attitudes toward the study of technology.**
Examples of evidence may include the selection of instructional strategies and the development of meaningful and challenging learning experiences that create an enthusiastic classroom environment and positive attitude within the students about the study of technology.

Explanation: In the space below, and by including appendices, explain how your technology teacher education candidates meet Standard 7 by describing appropriate assessment materials and student experiences related to the indicators above. Add as much text as needed by expanding the space below.

STANDARD 8—LEARNING ENVIRONMENTS

Technology teacher education program candidates design, create, and manage learning environments that promote technological literacy.

INDICATORS:

The following knowledge, performance, and disposition indicators provide guidance to better understand the scope of Standard 8.

The program prepares technology teacher education candidates who can:

Knowledge Indicators:

- Recognize rich learning environments that provide for varied educational experiences in the technology classroom and laboratory.
- Identify learning environments that encourage, motivate, and support student learning, innovation, design, and risk taking.

Performance Indicators:

- Design learning environments that establish student behavioral expectations that support an effective teaching and learning environment.
- Create flexible learning environments that are adaptable for the future.

Disposition Indicators:

- Exhibit safe technology laboratory practice by designing, managing, and maintaining physically safe technology learning environments.

RUBRIC FOR STANDARD 8-Learning Environments

Based upon the explanations and examples of student work submitted for Standard 8, an informed judgment will be made using the rubric below.

TARGET

Technology teacher education program candidates demonstrate a thorough understanding of effective teaching content identified in the standard in a way that allows them to provide multiple explanations and effective teaching decisions to maximize student learning of the subject matter standard.

ACCEPTABLE

Technology teacher education program candidates have a broad knowledge of effective teaching content as identified in the standard that can incorporate the subject matter content in a way that helps them develop quality-learning experiences for all students.

UNACCEPTABLE

Technology teacher education program candidates do not understand the relationship of content and effective teaching identified in the standard in a way that helps them develop learning experiences that integrates all the areas of technological subject matter.

Knowledge Indicators:

- **Recognize rich learning environment that provide for varied educational experiences in the technology classroom and laboratory.**
- **Identify learning environments that encourage, motivate, and support student learning, innovation, design, and risk taking.**
Examples of evidence may include the development of a technology classroom/laboratory or other environments that allow for different instructional experiences, study of new innovations, and ease of maintaining the learning environment, all which help to enhance student learning and risk taking.

Performance Indicators:

- **Design learning environments that establish student behavioral expectations that support an effective teaching and learning environment.**
- **Create flexible learning environments that are adaptable for the future.**
Examples of evidence may include maintaining discipline in the laboratory, developing barrier-free classrooms/laboratories, designing flexible learning environments for the future.

Disposition Indicators:

- **Exhibit safe technology laboratory practice by designing, managing, and maintaining physically safe technology learning environments.**
Examples of evidence may include laboratory safety, development of safety policies and procedures, safe practice in the laboratory, and the importance of having a safe work environment.

Explanation: In the space below, and by including appendices, explain how your technology teacher education candidates meet Standard 8 by describing appropriate assessment materials and student experiences related to the indicators above. Add as much text as needed by expanding the space below.

STANDARD 9 — STUDENTS

Technology teacher education program candidates understand students as learners, and how commonality and diversity affect learning.

INDICATORS:

The following knowledge, performance, and disposition indicators provide guidance to better understand the scope of Standard 9.

The program prepares technology teacher education candidates who can:

Knowledge Indicators:

- Design technology experiences for students of different ethnic, socioeconomic backgrounds, gender, age, interest, and exceptionalities.
- Identify how students learn technology most effectively by integrating current research about hands-on learning and learning about the content of technology.

Performance Indicators:

- Create technology experiences for students with different abilities, interests, and ages about the content of technology.

Disposition Indicators:

- Develop productive relationships with students so that they become active learners about technology and enhance their human growth and development.

RUBRIC FOR STANDARD 9-Students

Based upon the explanations and examples of student work submitted for Standard 9, an informed judgment will be made using the rubric below.

TARGET

Technology teacher education program candidates demonstrate a thorough understanding of effective teaching content identified in the standard in a way that allows them to provide multiple explanations and effective teaching decisions to maximize student learning of the subject matter standard.

ACCEPTABLE

Technology teacher education program candidates have a broad knowledge of effective teaching content as identified in the standard that can incorporate the subject matter content in a way that helps them develop quality-learning experiences for all students.

UNACCEPTABLE

Technology teacher education program candidates do not understand the relationship of content and effective teaching identified in the standard in a way that helps them develop learning experiences that integrates all the areas of technological subject matter.

Knowledge Indicators:

- **Design technology experiences for students of different ethnic, socioeconomic backgrounds, gender, and exceptionalities.**
- **Identify how students learn technology most effectively by integrating current research about hands-on learning and learning about the content of technology.**
Examples of evidence may include diverse student needs, gender, psychological, and physiological barriers effects.

Performance Indicators:

- **Create technology experiences for students with different abilities, interests, and ages about the content of technology.**
Examples of evidence may include learning theory, current brain research, student needs.

Disposition Indicators:

- **Develop productive relationships with students so that they become active learners about technology.**
Examples of evidence may include the advantages and disadvantages of student/teacher relationships, and how current research findings relate to student relationships.

Explanation: In the space below, and by including appendices, explain how your technology teacher education candidates meet Standard 9 by describing appropriate assessment materials and student experiences related to the indicators above. Add as much text as needed by expanding the space below.

STANDARD 10 — PROFESSIONAL GROWTH

Technology teacher education program candidates understand and value the importance of engaging in comprehensive and sustained professional growth to improve the teaching of technology.

INDICATORS:

The following knowledge, performance, and disposition indicators provide guidance to better understand the scope of Standard 10.

The program prepares technology teacher education candidates who can:

Knowledge Indicators:

- Demonstrate a continuously updated and informed knowledge base about the processes of technology.
- Continuously build upon effective instructional practices that promote technological literacy.

Performance Indicators:

- Apply various marketing principles and concepts to promote technology education and the study of technology.
- Collaborate with other candidates and professional colleagues to promote professional growth and professional development activities.
- Become actively involved in professional organizations and attend professional development activities to become better prepared to teach technology education.
- Develop a professional development plan for self-improvement in curriculum and instruction in technology education.

Disposition Indicators:

- Value continuous professional growth through involvement in a variety of professional development activities.
- Demonstrate the importance of professionalism by promoting technology organizations for students in the technology classroom.
- Reflect upon their teaching to improve and enhance student learning.

RUBRIC FOR STANDARD 10-Professional Growth

Based upon the explanations and examples of student work submitted for Standard 10, an informed judgment will be made using the rubric below.

TARGET

Technology teacher education program candidates demonstrate a thorough understanding of effective teaching content identified in the standard in a way that allows them to provide multiple explanations and effective teaching decisions to maximize student learning of the subject matter standard.

ACCEPTABLE

Technology teacher education program candidates have a broad knowledge of effective teaching content as identified in the standard that can incorporate the subject matter content in a way that helps them develop quality-learning experiences for all students.

UNACCEPTABLE

Technology teacher education program candidates do not understand the relationship of content and effective teaching identified in the standard in a way that helps them develop learning experiences that integrates all the areas of technological subject matter.

Knowledge Indicators:

- **Demonstrate a continuously updated and informed knowledge base about the processes of technology.**
- **Continuously build upon effective instructional practices that promote technological literacy.**
Examples of evidence may include the importance of how to keep current about the knowledge base and processes of technology, and how to continuously improve the instructional practices in the technology education classroom through conferences, meetings, and other professional development activities.

Performance Indicators:

- **Apply various marketing principles and concepts to promote technology education and the study of technology.**
- **Collaborate with other candidates and professional colleagues to promote professional growth and professional development activities.**
- **Become actively involved in professional organizations and attend professional development activities to become better prepared to teach technology education.**
- **Develop a professional development plan for self-improvement in curriculum and instruction in technology education.**
Examples of evidence may include designing professional projects that focus on collaboration with peers, administration and school boards, improving the image and perception of technology education through marketing (brochures, etc.), advisory boards, laboratory designs.

Disposition Indicators:

- **Value continuous professional growth through involvement in a variety of professional development activities.**
- **Demonstrate the importance of professionalism by promoting technology organizations for students in the technology classroom.**
- **Reflect upon their teaching to improve and enhance student learning.**
Examples of evidence may include the importance of providing leadership through personal and professional growth, self-assessment, professional organizations, promoting technology clubs and student organizations (TSA), student competitions.

Explanation: In the space below, and by including appendices, explain how your technology teacher education candidates meet Standard 10 by describing appropriate assessment materials and student experiences related to the indicators above. Add as much text as needed by expanding the space below.

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