



**State Board of Education Workshop
Career and Technical Education Course Revisions:
Overview and Process**

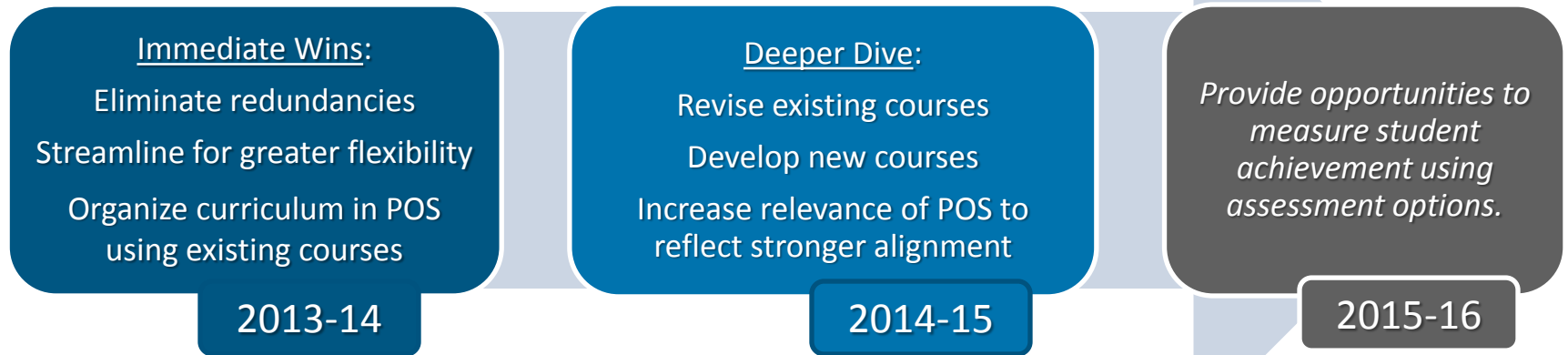
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Oct. 24, 2013

Multi-Phased Approach: Overview

| Phase | Goal | Implementation |
|------------------|--|-------------------|
| Phase I | Streamline our existing courses and programs of study | 2013-14 SY |
| Phase II | Add relevant new courses and new programs of study, revise courses to align to higher student expectations | 2014-15 SY |
| <i>Phase III</i> | <i>Measure success of students with rigorous assessment options for all courses.</i> | <i>2015-16 SY</i> |



Career & Technical Education: Terms

- **CTE:** Career & Technical Education
- **CTE Courses:** Elective - graduation requirements: *3 credits in an Elective Focus* – CTE, Math and Science, Fine Arts, Humanities, Advanced Placement (AP) or International Baccalaureate (IB)
- **Programs of Study:** Progressive sequence of subject/topic specific courses within a promoted Career Cluster
- **Career Cluster:** 16 nationally recognized occupational areas (USDOE, USDOL)
- **EPSO:** Early PostSecondary Opportunities, which allow students to obtain postsecondary credit hours while in high school
- **CTE Concentrators:** Students who take three (3) or more courses in a Program of Study (POS) or Career Cluster
- **Pathway:** Robust, aligned learning experience, which blends a seamless academic/career pathway from grades 7th-16th
- **Postsecondary:** TN College of Applied Technology, 2-yr Community College, 4-yr University/College

Choose Your Pathway to Success

Tennessee's 16 Career Clusters

Phase I:
Moved from 7
broad areas of
focus to 16
career clusters



http://www.tn.gov/education/cte/Career_Clusters/Career_Clusters.shtml

Redefining Student Learning



Tennessee's CTE: Robust, Aligned Academic/Career 7th-16th Learning Pathway

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Immediate Wins:

- Eliminate redundancies
- Streamline for greater flexibility
- Organize curriculum in POS using existing courses

2013-14

Deeper Dive:

- Revise existing courses
- Develop new courses
- Increase relevance of POS to reflect stronger alignment

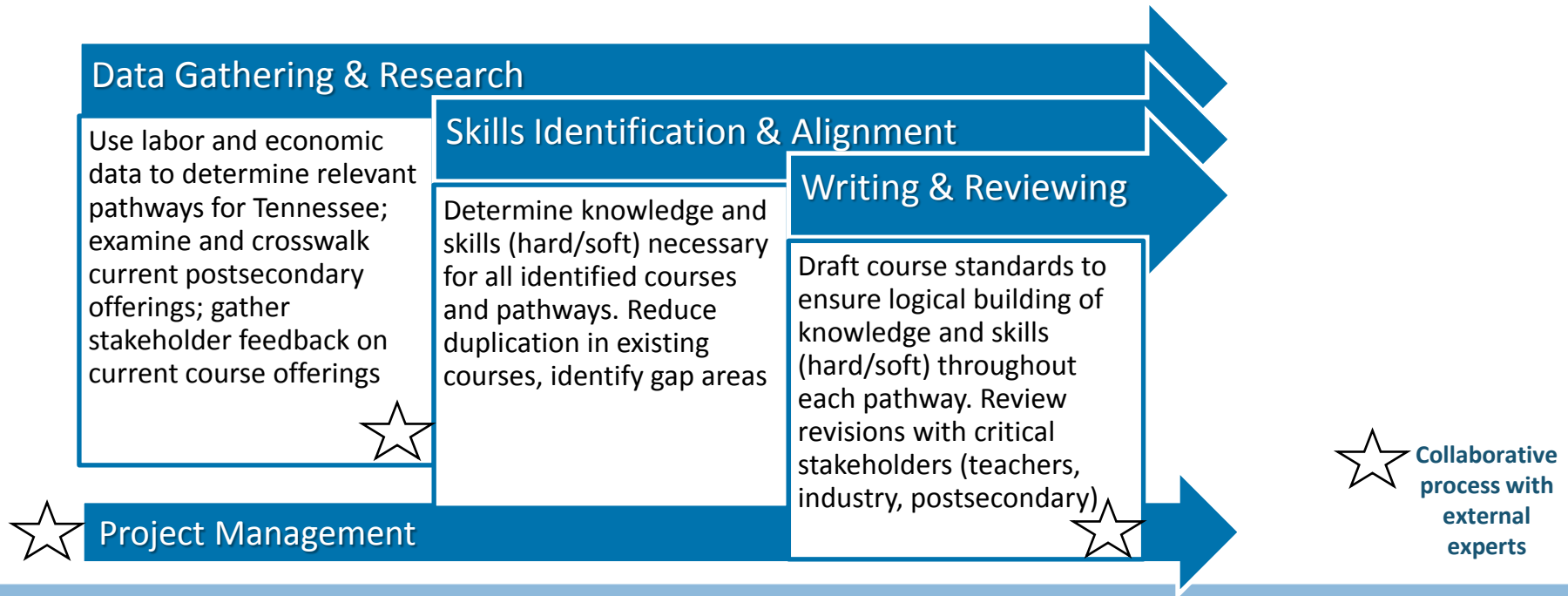
2014-15

Provide opportunities to measure student achievement using assessment options.

2015-16

Standards Revision Process Overview

- 1. Data Gathering and Research:** Determine needs and opportunities of state and the strengths of existing CTE course offerings.
- 2. Skills Identification and Alignment:** Determine specific knowledge/skills needed for students to be successful in identified courses and pathways.
- 3. Writing and Reviewing:** Craft revised course standards and vet recommendations with key stakeholders.



Standards Revision Process

External Support

Initiated a collaborative and facilitative process that engaged external experts to supplement internal staff capacity and to build internal staff expertise

| Area of Expertise | External Support |
|--|---|
| Real time and lagging workforce and labor data interpretation | Jobs for the Future (JFF) |
| Cognitive demand in standards, framework for successful pathways | Educational Policy Improvement Center (EPIC) |
| CTE content knowledge, standard writing and editing | Center for Occupational Research and Development (CORD) |
| Quality instructional practices | Peabody College, Vanderbilt University |
| Project management | Thomas Gibney, independent contractor (embedded with staff) |

Standards Revision Process

First Step: Data Gathering & Research

CTE Consultants researched and collected data from multiple measures and stakeholders:

- Regional, State, National labor and economic development data (lagging and real-time)
- Statewide CTE teacher survey on existing courses and standards (540+ teacher respondents)
- Industry Advisory Councils
- Curriculum scans from other states, endorsed professional organizations, and accrediting bodies

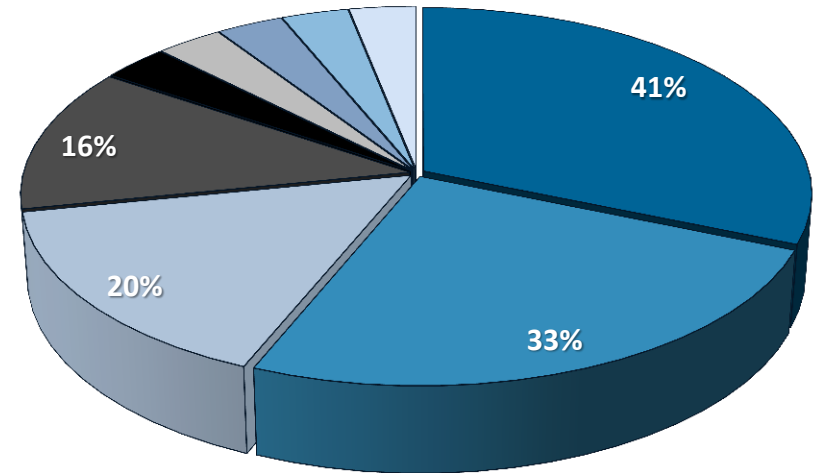
Standards Revision Process

First Step: Data Gathering & Research

Example: Agriculture

- Workforce Data:
 - Job postings and state supply/demand trends showed increases in veterinary science, agriculture engineering, and food production and processing
- Statewide CTE teacher survey 540 + responses, of which 50 were Agriculture teachers
- Industry Advisory Councils: Agriculture Council, "Team Ag Ed," TN Farm Bureau Federation

Agriculture Teacher Results



| Recommendation | Responses |
|--|-----------|
| Provide opportunity for course flexibility | 41% |
| Reduce the number of pathways | 33% |
| Course standards are too basic, should have more rigor | 20% |
| Course topics are too specific, need more general preparation pathways | 16% |
| Other comments (combined) | 20% |

Standards Revision Process

First Step: Data Gathering & Research

Example: Agriculture

Curriculum Scans:

- Special Course Requests submitted by TN school districts
- Other State Agriculture Offerings: Georgia, Florida, Oklahoma, Colorado, Michigan, Wisconsin, North Carolina, Indiana, California
- Postsecondary Agriculture Offerings: Reviewed 26 postsecondary agriculture programs, including top 10 national programs (i.e. Purdue University, Texas A&M, Cornell University) and all Tennessee offerings
- National Agriculture Content Standards published by the *National Council for Agricultural Education*

Standards Revision Process

Second Step: Skills Identification & Alignment

CTE Consultants culled and synthesized data into the following actions:

- Identified Programs of Study (POS) with weak postsecondary and industry alignments
- Identified academic and skills (hard/soft) gaps in existing courses
- Identified duplicate standards across existing courses
- Created “groupings” of knowledge and skills needed for each stage of a pathway/POS – building progressively and sequentially by course

Standards Revision Process

Second Step: Skills Identification & Alignment

Example: Agriculture

Created sequences of courses (Programs of Study/Pathways) to align with labor and economic data and postsecondary offerings:

Sampling

- Developed new program of study/pathway in Food Science
- Recommended changes to Agriculture Engineering to address new opportunities
- Outlined necessary skills (hard/soft) in “key content areas,” building progressively through courses/programs of study
- Identified and aligned successful work-based learning and dual credit/dual enrollment opportunities

Standards Revision Process

Third Step: Writing & Reviewing

CTE Consultants revised course standards:

- Infused revised standards from other existing CTE courses
- Embedded stronger technical skills
- Aligned developed and revised course standards with Common Core State Standards for Literacy in Technical Subjects (and Math where applicable)
- Aligned and referenced general education standards (e.g. Biology), where applicable

Stakeholders reviewed draft standards and provided critical feedback:

- 78 CTE Tennessee teachers across multiple subjects
 - Average of 14 years of experience
 - Representing: East (34%), Middle (41%), and West (25%)
- Professional CTE Teacher Associations
- Other TDOE divisions
- Industry Advisory Councils and Individual Companies
- Postsecondary Faculty and Teacher Prep Faculty

Standards Revision Process

Third Step: Writing & Reviewing

Example: Agriculture

Stakeholders reviewed draft standards and provided critical feedback:

- Engaged 29 secondary and 6 postsecondary Agriculture teachers
- Tennessee Association of Agriculture Educators (TAAE), Ag teacher preparation representatives, and Agriculture Advisory Council
- Curriculum & Instruction Division reviewed science content alignment
- Tennessee Department of Agriculture
- Tennessee Farm Bureau Federation

Standards Revision Process

Third Step: Writing & Reviewing

Example: Agriculture

| Feedback Excerpts | Resolution | Reviewer |
|---|--|--|
| <i>Agricultural electrification including low-voltage applications was not clearly addressed.</i> | Agricultural electrification language was added | High School Agriculture Teacher |
| <i>Introduction to Agricultural Sciences (Middle School) should include seventh and eighth grade alignments.</i> | Added middle school general education standards references in literacy and science | Middle School Agriculture Teacher |
| <i>Excellent Work! Veterinary and Animal Science Program of Study is very complete with high expectations. It will also give the teachers the flexibility needed to address different situations.</i> | Met with stakeholder - pledged support for work | Tennessee Farm Bureau Federation |
| <i>The standards do comprise a well-developed program (Horticulture Science Program of Study). Students who are able to complete the four course sequence will experience related but not repetitive standards.</i> | Postsecondary faculty validated skills/knowledge necessary for pathway | Horticulture Instructor, Walters State Community College |

Standards Revision Process

Course Standard Comparison

Career Cluster: Agriculture, Food & Natural Resources

Current:

Plant and Soil Science

- 5.0** Analyze the chemical elements essential to plant nutrition and the importance and benefits of proper soil fertility.
- 5.1** Specify and explain terms related to soil chemistry and plant nutrition.
- 5.7** Measure soil pH and its effects on nutrient availability.
- 5.8** Assess the nutrient deficiency symptoms in plants.

New:

Plant and Soil Science

- 9.** Assess the importance of the sixteen nutrients essential to plant growth and development. Identify nutritional deficiencies and disorders, distinguish among signs of nutrient deficiency in plants, make recommendations for appropriate treatments, and prescribe preventative control measures for major agricultural crops, including corn, soybean, cotton, tobacco, hay, pasture, and forest. (TN CCSS Reading 2, 5; TN CCSS Writing 2, 4, 9; TN Biology II 7)

Pending
Approval

What Does A Pathway Look Like?

High School Program of Study (Agriculture Career Cluster)

Technology College (Industry Certification)

Vet Assistant /
Lab Caretaker
\$30,200

Community College (A.A./A.S)

Veterinary
Tech \$37,000

University/College
Advanced Degrees

Veterinarian
\$125,300

SUSTAINABLE

Secondary &
Postsecondary
Academic
Alignment

Industry
Engagement

Community
Engagement

RELEVANT

Work-Based Learning
(grades 7-14)

Early Postsecondary
Opportunities
(Grades 9-12)

Career Awareness
(Grades 7-14)

Stackable Credentials
(Grades 9+)

High School Program of Study (Advanced Manufacturing Career Cluster)

Technology College (Industry Certification)

CNC Operator
\$35,580

Community College (A.A./A.S)

Mechanical
Engineering
Technician
\$50,660

University or
College (B.A./B.S)

Mechatronics
Engineer
\$82,440

Standards Revision Process

Revised, New, Retired Courses

Example: Agriculture

| Revised Courses | List of Existing Courses used in Development of Revised CTE Courses | | |
|---|--|---|--|
| Agricultural and Biosystems Engineering | <i>Agricultural Engineering</i> | | |
| Agricultural Business and Finance | <i>Agricultural Business/Finance</i> | <i>Agricultural Economics</i> | |
| Agricultural Power and Equipment | <i>Agricultural Power and Equipment</i> | <i>Agricultural Engineering</i> | |
| Agriscience | <i>Agriscience</i> | <i>Principles of Horticultural Sciences</i> | <i>Principles of Agricultural Sciences</i> |
| Small Animal Science | <i>Small Animal Care</i> | | |
| Supervised Agricultural Experience (SAE) | <i>National SAE expectations</i> | | |
| Veterinary Science | <i>Veterinary Science</i> | <i>Animal Biotechnology</i> | |

Standards Revision Process

Revised, New, Retired Courses

Example: Agriculture

| New Courses | List of Existing Courses used in Development of New CTE Courses | | |
|---|--|---|---|
| Advanced Food Science | <i>LEA Special Course (Meat Science)</i> | | |
| Applied Environmental Science | <i>Wildlife Management and Recreation</i> | <i>Plant and Soil Science</i> | <i>Forestry Management</i> |
| Food Science and Safety | <i>LEA Special Course (Meat Science)</i> | | |
| Large Animal Science | <i>Livestock Management</i> | <i>Horse Science</i> | <i>Animal Biotechnology</i> |
| Natural Resources Management | <i>Wildlife Management and Recreation</i> | <i>Plant and Soil Science</i> | <i>Forestry Management</i> |
| Principles of Plant Science and Hydroculture | <i>Aquaculture/Hydroponics</i> | <i>Principles of Horticultural Sciences / Plant Biotechnology</i> | <i>Principles of Agricultural Sciences / Advanced Principles of Agricultural Sciences</i> |
| Principles of Food Production | <i>Advanced Principles of Agricultural Sciences</i> | <i>Plant Biotechnology</i> | |

Standards Revision Process

Revised, New, Retired Courses

Example: Agriculture

| Retired Courses | Courses no longer relevant due to use in developing revised and new CTE courses or due to misalignment with industry opportunities/needs and postsecondary offerings | | |
|--|--|--|--|
| Advanced Principles of Agricultural Sciences | <i>Standards included in new Principles of Plant Science and Hydroculture course</i> | | |
| Advanced Aquaculture Sciences | <i>Standards included in new Principles of Plant Science and Hydroculture course</i> | | |
| Forestry Management | <i>Standards included in new Environmental Resources courses</i> | | |
| Horse Science | <i>Standards included in new Large Animal Science course</i> | | |
| Livestock Management | <i>Standards included in new Large Animal Science course</i> | | |
| Plant Biotechnology | <i>Standards included in new Principles of Food Production course</i> | | |

Standards Revision Process

Next Steps

Communications

- Teacher Associations: Ongoing
- Subject Area Teachers: Ongoing
- School Counselors: Oct. & Feb.
- Postsecondary teacher prep programs: Oct.
- Superintendents Study Councils: Oct.-Jan. & Ongoing
- CTE Directors: Ongoing

Meetings & Training

- Fall CTE Director Meeting: Sept.
- State Board of Education Meeting: Oct.
 - Public commentary on course standards
- LEAD Conference: Oct.
- Town Hall meetings: Nov.-May
- Bi-Weekly/Monthly Webinars: Nov.-May
- State Board of Education Meeting: Jan.
 - Public commentary on course standards
- Regional visits and Workshops: Nov.-Ongoing
- Teacher Professional Development: Nov.-Ongoing
- Winter CTE Director Meeting: Feb.
- School Counselors Conference: Feb.
- Spring CTE Director Meeting: April
- CTE Summer Institute: July

| Activity | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | March | April | May | June | July |
|----------------------------------|------------------------------------|-----------------------------------|-----------------------------------|------|-------------|------|-------|-------|-----|------|------|
| Communications | [Green bar spanning Sept. to July] | | | | | | | | | | |
| State Board of Education Meeting | | [Green bar] | | | [Green bar] | | | | | | |
| Teacher Training | | | [Green bar spanning Nov. to July] | | | | | | | | |
| CTE Director Training | | [Green bar spanning Oct. to July] | | | | | | | | | |
| Program of Study Release | | | [Green bar] | | | | | | | | |



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