

ASSOCIATE SUPERINTENDENT APPROVAL

RW for ML

STATE BOARD MEETING DATE May 19, 2014

SUBJECT: Consideration for Career and Technical Education programs integrating Arizona's College and Career Ready Standards in Mathematics for the purpose of allowing the issuance of mathematics credits, pursuant to R7-2-302 (4)(a)

SUBMITTED BY: Dan Brown

MANAGEMENT TEAM REVIEW:

BACKGROUND INFORMATION:

Pursuant to R7-2-302(4), local governing boards or charter schools may grant Career and Technical Education (CTE) program completers credits toward the Board English, mathematics, science and economics credit requirements for graduation if 1) the State Board has approved the CTE program for equivalent credit to be used toward the Board English, mathematics, science and economics credit requirements of graduation; 2) the credit or partial credit only counts toward one credit or partial credit toward satisfying the 22 total required credits, and 3) the student who satisfies any part of the Board English, mathematics, science and economics credit requirements of graduation through the completion of a CTE program must earn 22 credits total credits to meet the high school graduation requirements.

On December 2, 2013, the Board approved three CTE programs for equivalent credit to be used toward the 4th credit of mathematics required in the Board high school graduation requirements. These programs included:

- Automotive Technologies
- Business Management and Administrative Services
- Software Development

Utilizing the attached review process for analyzing Career and Technical Education industry based technical skill standards for integrated Arizona's College and Career Ready Standards in Mathematics, two additional programs are being presented for consideration. It is requested that the Board approve the following additional CTE programs for equivalent credit to be used toward the 4th credit of mathematics required in the Board high school graduation requirements.

- Mechanical Drafting
- Architectural Drafting

BOARD ACTION REQUESTED: [] INFORMATION [X] ACTION/DESCRIBED

BELOW: Request for approval for the purpose of allowing the issuance 4th credit in mathematics, pursuant to R7-2-302 (4)(a)

ATTACHMENTS: YES [X] NO []

Process for Establishing Career and Technical Educations Programs Eligible for Academic Credit in Mathematics

Goal 1:

The State Board of Career and Technological Education (SBCTE) will approve CTE programs as eligible programs for local governing boards to grant academic credit in mathematics. This academic credit in mathematics, earned upon completion of an approved CTE program is intended to satisfy the graduation requirement of a 4th credit in mathematics exclusively.

Goal 2:

Establish a rigorous process for a comprehensive analysis of CTE programs that utilizes both the Arizona CTE industry standards and AZCCRS mathematics to ensure that sufficient integration of high school mathematics is evident.

Process:

This multi-step process is intended to provide a coherent framework across multiple education agencies that supports the identification, approval and continued support for CTE programs granting a 4th credit in mathematics.

A. Process at the SEA and State Board of Career and Technical Education Level

Career and Technical Education programs are delivered through a required sequence of courses measured in Carnegie Units. CTE programs require a minimum of two or three Carnegie Units depending on the individual CTE program's technical skill standards. Each Carnegie Unit requires a minimum of 120 hours of instructional time (i.e. a CTE program requiring a 2 Carnegie Unit course sequence has a minimum of 240 hours instructional time and a program requiring a 3 Carnegie Unit course sequence requires a minimum of 360 hours instructional time.) A CTE program seeking to award 4th credit in mathematics must allow for a minimum of 123 hours of mathematics instruction. This can be accomplished through a variety of models, such as delivering the 123 hours of math instruction spread throughout the two or three Carnegie Unit program; partnering with a math instructor to teach a parallel math course with the CTE course; or co-teaching the CTE courses.

As Arizona's CTE Industry Technical Skill Standards are updated and revised for specific CTE programs, the following process will unfold in a timely manner:

- The CTE industry standards revision process will include collaboration with ADE's K-12 academic standards specialists to ensure appropriate connections are addressed during the standards development process
- CTE programs with significant mathematics content in their updated industry standards will be identified by ADE's CTE staff
- A collaborative team of ADE CTE and high school mathematics specialists will create a crosswalk from the AZCCRS mathematics to the specific CTE program industry standards.
- K-12 Standards specialists will complete an analysis of integrated high school mathematics standards to individual CTE program's industry standards. The analysis of the crosswalk includes the following:

- Determine the total number of aligned mathematics standards to CTE industry standards identified in the crosswalk
- Match the identified math standards in CTE crosswalk to specific high school math courses
- Analyze the crosswalk document alignment between the CTE industry standards and the high school mathematics standards to determine if substantial instructional time is evident (123 hours of math instruction integrated into the specific CTE program as per A.R.S. 15-901 and ADE Policy Number GE-18)
- CTE programs with revised and current industry standards that have significant high school mathematics integration will be presented to the Arizona State Board of Career and Technical Education for approval as eligible programs for an academic credit in mathematics.
- Upon approval of the State Board of Career and Technical Education Board, a collaborative team of expert CTE and high school mathematics educators will develop instructional support documents aligned to sound instructional practice for the CTE programs
- Local Education Agencies have the opportunity to request consideration to grant academic credit for CTE programs that have not been approved by the State Board of Career and Technological Education for that purpose by presenting compelling evidence to the Board that the programs have increased rigor and sufficiently integrated Arizona's College and Career Ready Standards.
- ADE will respond to requests from the State Board of Career and Technological Education that specific CTE program reviews be undertaken to determine eligibility for granting academic math credit
- ADE will continue to monitor LEAs annual submissions of several letters of assurance which include:
 - Declaration of Curricular and Instructional Alignment to the Arizona Academic Standards submitted separately by the local governing school board president, the LEA superintendent and each school principal. This assures the SBE and ADE that local LEAs have aligned their curriculum and evaluation of instruction to the state's adopted academic standards
 - CTE program assurances submitted through each LEAs Carl Perkins grant application process that addresses fidelity to program implementation, fiscal oversight and accountability requirements. LEAs provide assurances to the SBE and ADE that they are fully implementing the essential elements of an approved CTE programs in the following areas:
 - Delivers a coherent sequence of instruction.
 - Teaches all the state-designated program standards.
 - Specified on the current CTE Program List.
 - Taught by an appropriately certified teacher
 - Evaluates program performance annually and meets or exceeds established State Performance Measures.
 - Offers student work-based participation that involves actual work experience and connects classroom learning to work activities.
 - Requires student participation and Career Exploration for grades 7-9.
 - Requires a Career and Technical Education Student Organization (CTSO) to be organized for the CTE secondary programmatic area.
- ADE will continue to routinely monitor CTE programs for compliance to Carl Perkins grant requirements. This process includes reviewing components of a CTE program that go beyond compliance, including the implementation of academic credit which is designated as a component of an exemplary program on the CTE monitoring document.

B. PROCESS at the LEA Level Upon CTE Program Approval by the State Board of Career and Technical Education

The State Board of Career and Technical Education has the responsibility of identifying for LEAs, specific CTE programs that are eligible to grant academic credit in mathematics as stipulated in Administrative Code R7-2-303.02(4)(a). It is important to note though, the decision making process to grant an integrated math credit upon completion of a CTE program begins with the SBCTE and continues through to the local Governing Board. As LEAs and their Governing Boards determine credits that will be granted through their CTE programs there are several factors that must be in place. The SBCTE recommendations for specific CTE programs that are eligible for academic credit in mathematics are subject to the following provisions at the local level:

- Local Governing Boards will ensure that:
 - all local CTE programs meet the 8 elements of approved CTE programs including an active, engaged local industry based advisory board
 - all local CTE programs implement current industry standards
 - Local Education Agency (LEA) implements a rigorous, well defined curriculum review process that includes connections to Arizona's academic standards
 - Local CTE programs under consideration for granting an integrated math credit will undergo a rigorous curriculum review/development process that provides evidence of substantial high school mathematics content
 - Local CTE programs providing integrated math credit will provide instruction with fidelity to both the specific CTE program industry standards and the academic mathematics standards at the high school level
 - Local CTE programs have appropriately certified teachers in place

C. Continued Support at the SEA Level:

ADE is committed to providing ongoing, relevant support to districts seeking to integrate credit for mathematics in the CTE programs. Examples of support provided by ADE to LEAs across the state are as follows:

- Provide a guidance document that demonstrates a comprehensive and detailed model of an effective curriculum review/development process for integrating an integrated math credit into a CTE program
- Develop a comprehensive professional development plan to support LEAs in implementing a rigorous curriculum review process that will include face-to-face trainings, webinars and online resources
- ADE will develop and facilitate a comprehensive professional development plan to support LEAs in integrating rigorous math instruction into specific CTE programs:
 - Since 2010, Arizona educators have actively engaged in the implementation of the research-based Math-In-CTE professional development model. The model was developed by the National Research Center for Career and Technical Education and is designed to assist teams of mathematics and CTE teachers in preparing lessons that maximize the mathematics taught in the CTE curriculum and ensure that the mathematics is taught appropriately. This process teaches mathematics and CTE teachers to work as a team in course planning and lesson

- plan development. The professional development model will be extended to include a focus on the integration of high school mathematics standards.
 - ADE will provide professional development in Arizona's College and Career Ready Standards by offering both Phase 2 and Phase 3 opportunities. Phase 2 provides training in deeper understanding of the content expectations of the standards and pedagogical strategies for achieving these goals. Phase 3 provides training in the integration of the standards across content areas, including within CTE programs.
- ADE will collaborate with external partners to provide ongoing support in the following ways:
 - Working with the Arizona Curriculum Consortia for CTE, develop curriculum guides, robust units and lesson plans that maximize integrated mathematics standards in CTE programs.
 - Explore opportunities with ACTEaz to extend the Premier Professional Development Series for Career and Technical education teachers to include methodologies for integrated mathematics instruction for the approved CTE programs.
- Identify model CTE programs with integrated mathematics instruction that can serve as a resource to other CTE programs across the state

Current Results and Pending Work from Recent CTE Program Review:

- Nine CTE programs completed the SEA review process.
 - One CTE program lacked evidence of integrated math standards within the CTE state adopted industry standards. After the industry standards for this CTE program industry standard are revised to current workplace expectations, it is recommended that this program be reconsidered.
 - Accounting
- Eight CTE programs were determined eligible for consideration as eligible to provide academic math credit
 - Automotive Technologies
 - Business Management and Administrative Services
 - Software Development
 - Architectural Drafting
 - Mechanical Drafting
 - Advanced Construction Technologies
 - Engineering Sciences
 - Welding Technologies
- An analysis of data available to ADE's CTE unit will determine if LEAs are currently providing academic math credit in CTE programs beyond the anticipated 8 CTE programs that will be approved by the State Board of Career and Technological Education by June 2014
 - LEAs identified will be individually contacted to determine the local curriculum review and development process that was utilized to support the decision to grant academic math credit with the CTE program

- CTE programs that are deemed to have a sufficiently rigorous LEA curriculum review and development process will be presented to the State Board of Career and Technological Education for one-time approval consideration
- ADE will provide guidance and technical assistance to an LEA that does not have evidence of implementing a rigorous curriculum review and development process

Short Term Timeline:

- December 2013 State Board of Career and Technical Education meeting
 - Three CTE programs were presented and approved by the State Board of Career and Technological Education on December 13, 2013 as eligible programs for local governing boards to grant academic credit in mathematics:
 - Automotive Technologies
 - Business Management and Administrative Services
 - Software Development
- May 2014 State Board of Career and Technical Education meeting
 - Two CTE programs will be presented to the State Board of Career and Technological Education for approval as eligible programs for local governing boards to grant academic credit in mathematics:
 - Architectural Drafting
 - Mechanical Drafting
- June 2014 State Board of Career and Technical Education meeting
 - Three CTE programs will be presented to the State Board of Career and Technological Education for approval as eligible programs for local governing boards to grant academic credit in mathematics:
 - Advanced Construction Technologies
 - Engineering Sciences
 - Welding Technologies
- October 2014 State Board of Career and Technical Education meeting
 - Additional CTE programs will be presented to the State Board of Career and Technological Education for approval as eligible programs for local governing boards to grant academic credit in mathematics.
- December 2014 State Board of Career and Technological Education meeting
 - CTE programs will be presented to the State Board of Career and Technological Education for approval as eligible programs for local governing boards to grant academic credit in economics.
- The schedule for review of CTE programs eligible to grant science credit will be determined utilizing the 2005 *“Arizona Science Standards Articulated by Grade Level –High School.”*