

**STATE SUPERINTENDENT'S  
TECHNOLOGY AND ENGINEERING EDUCATION  
AND SCIENCE EDUCATION  
TASK FORCE REPORT**

Division for Academic Excellence

August 2008

(This document is also available on the DPI website at:  
[http://dpi.wi.gov/te/tee-sci final report.pdf](http://dpi.wi.gov/te/tee-sci%20final%20report.pdf))



Wisconsin Department of Public Instruction  
Elizabeth Burmaster, State Superintendent  
Madison, Wisconsin



## Introduction

In November 2006, State Superintendent Elizabeth Burmaster released the recommendations developed by the High School Task Force. The 70-member task force emphasized rigor, relevance, and partnerships as key components to ensure a high school education continues to equip students with the knowledge and skills to succeed in postsecondary education, the high-skills workplace, and as citizens of our global economy. To advance the recommendations of the task force, State Superintendent Burmaster announced Wisconsin's participation in the *Partnership for 21<sup>st</sup> Century Skills* and the *American Diploma Project Network*, both of which emphasize the knowledge and skills students require for the 21st century. Both projects also underscore the importance of acquisition and application of knowledge. This focus was envisioned in Recommendation B from the 2006 State Superintendent's High School Task Force Report. Selected strategies include:

- Ensure that all students have access to a variety of options for learning, including the arts, co-curricular activities, work-based learning, service learning, and accelerated offerings, to fully engage all types of learners.
- Examine new models and identify best practices in student learning that are both authentic and relevant and fully assess the rigor and viability of multiple pathways to academic achievement.
- Promote instructional practice that includes problem-solving and creativity and prepares students to solve real-world problems and participate as citizens in a diverse and multi-cultural world.

Public education is the foundation of economic security in Wisconsin in an increasingly competitive global economy. Ensuring our high school students are ready for the workplace, college, and citizenship is important to the well-being and financial competitiveness of our state. In the 21<sup>st</sup> century, our high school graduates need rigorous coursework to gain the knowledge and skills to be critical thinkers, problem solvers, innovators, and effective communicators. Our students must engage in advanced science, technology, and mathematics coursework.

A high school education that has meaning for today requires united efforts to engage all students in learning to ensure academic achievement and a strong foundation for success. Equally important, education options and pathways to success are not limited. One instructional method does not suit all learning styles.

As teachers design learning experiences that align to PreK-16 standards and workplace demands, interest has increased regarding equivalency credit as a means for demonstrating knowledge and skills. Attention has been given to science by recognizing science knowledge can come from many sources. The State Superintendent first established a task force that recommended to the department that equivalent science credit can be given for certain agriculture courses.<sup>1</sup> In a similar manner, State Superintendent Burmaster convened a technology and engineering

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<sup>1</sup> The agriculture and science task force report at <http://dpi.wi.gov/cte/agprogram.html>.

education and science education task force with a charge to examine the relationship of technology education and Project Lead the Way (PLTW) offerings to science education.

## Task Force Background

The task force consisted of licensed technology education teachers, including several who have taught PLTW<sup>2</sup> courses, the president of the Wisconsin Technology Education Association (WTEA), and licensed science education teachers, including representatives of the Wisconsin Society of Science Teachers (WSST). Each brought content expertise in their respective area to the work of the task force.

The task force grounded its work in PI 18.02, Wis. Admin. Code, which defines “equivalent graduation policy” as “a broad policy which meets the credit requirements specified for each subject area, but which permits selected equivalent courses as long as such courses contain the time allotment and substantially the same objectives to develop the knowledge, concepts, and skills of the course for which an equivalent is proposed.” The task force was given the charge to examine the technology education standards and Project Lead the Way (PLTW) courses for science content and possible equivalency. Additionally, the task force addressed PLTW courses and teacher licensing.

The task force advances two sets of recommendations. One focuses on the relationship of technology education standards to science education standards. The second set centers on the relationship of PLTW courses to the state’s science education standards.

## Recommendations for Technology and Engineering Education Courses

The task force strongly recommended developing a process to award science equivalency credit for technology and engineering education classes. This recommendation is firmly grounded in PI 18.02, Wis. Admin. Code, and the Wisconsin model academic standards for technology education and science. The recommendations are as follows:

- Because many technology education courses contain science content, the Department of Public Instruction (DPI) should establish an equivalency process for technology education courses similar to the process established by agriculture and science equivalency.
- Because *Wisconsin’s Model Academic Standards for Science* and *Wisconsin’s Model Academic Standards for Technology Education* provide a foundation for the course equivalency process, a crosswalk of the science and technology education standards should be completed. This crosswalk will then become the basis for districts to document specific science course content in the proposed technology education equivalent course.

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<sup>2</sup> These teachers have taught PLTW courses and some have PLTW certification.

- Because acceptance of science equivalency credit for technology education is critical, the DPI should work collectively with the University of Wisconsin System Administration and other institutions of higher education to accept approved equivalency courses as fulfilling certain science requirements for college admission.

## **Recommendations for PLTW Courses**

Project Lead the Way is a national organization that offers a standardized pre-engineering curriculum. The PLTW courses are considered technology education courses, and licensed technology education teachers (WDPI #220) are recognized as appropriately licensed to teach all of the following PLTW courses:

- Introduction to Engineering and Design (IED)
- Principles of Engineering (POE)
- Computer Integrated Manufacturing (CIM)
- Biotechnical Engineering (BIO)
- Digital Electronics (DE)
- Civil Engineering and Architecture (CEA)
- Aerospace Engineering (Aero)
- Engineering Design and Development (EDD)

PLTW requires each instructor to complete specific PLTW professional development training leading to course certification. The training has typically been a two-week professional development session at the conclusion of which teachers are “PLTW certified.” However, the PLTW certification is not synonymous with Wisconsin’s teacher licensing requirements.

With the adoption of PLTW courses, the school agrees to teach the standardized curriculum. Because the content of a PLTW course is the same in each school, the task force was able to analyze content and make a recommendation related to each PLTW course.

Please note these recommendations are related to PLTW-specific courses and not related to technology education courses that may have similar titles. Other programs offering similarly named courses may also be eligible for science equivalency by applying for equivalency under the process for technology and engineering education courses. The task force spent time evaluating the content of each PLTW course for possible science equivalency and examining the licensing issues unique to each PLTW course.

## **Principles of Engineering and Biotechnical Engineering**

- Principles of Engineering (POE) and Biotechnical Engineering (BIO) contain significant science content. A high school may apply for science equivalency credit through an abbreviated DPI process, when a technology education licensed teacher (WDPI #220) is teaching either of these courses. Please use DPI application form PI-1803-TE PLTW when applying for PLTW science equivalency course credit.

- While POE and BIO are technology education courses, it is possible that either of the two courses could be taught by an appropriately licensed science teacher (POE – WDPI #625 and BIO – WDPI #605) because of the significant science content in both PLTW courses.

## **Digital Electronics, Civil Engineering and Architecture, and Aerospace Engineering**

- Digital Electronics (DE), Civil Engineering and Architecture (CEA), and/or Aerospace Engineering (Aero) contain insufficient science content and are recognized as technology education courses. However, if a school would like to consider these courses for science equivalency credit when taught by a technology education teacher (WDPI #220), evidence of supplemental content must be provided through the submitted equivalency process (DPI Form PI-1803-TE PLTW).

## **Engineering Design and Development, Introduction to Engineering and Design and Computer Integrated Manufacturing**

- Engineering Design and Development (EDD), Introduction to Engineering and Design (IED), and Computer Integrated Manufacturing (CIM) does not contain sufficient science content and are recognized as technology education courses (WDPI #220). These courses are not to be considered for science equivalency.

Wisconsin has a long tradition of quality education, and the recommendations from this task force reinforce our commitment to serve all students. The task force recommendations to develop a process to award science equivalency credit for technology and engineering education classes, including PLTW courses, are firmly in line with the 2006 State Superintendent’s High School Task Force Report recommendations. These recommendations will allow our students full access to rigorous classes and the ability to pursue multiple pathways to achieve academic success.

## State Superintendent's Technology and Engineering Education And Science Education Task Force Members

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### Technology Education Teachers:

Mike Beranek  
Blair-Taylor High School

Scott Foster  
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Sun Prairie High School

Steve Johnston (PLTW Certified)  
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Jeremy Meyer (PLTW Certified)  
Green Bay Preble High School

Jacob Mihm (PLTW Certified)  
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Mike Roth (WTEA President)  
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### Science Teachers:

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Appleton North High School

Dave Bergerson  
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