Dear Board of Regents,

The New York State Technology and Engineering Educators Association believes keeping Regulation 100.4, c, 1, v for 1 unit of Technology Education is the appropriate choice for ALL students in New York State. Here are some of the reasons why the proposed changes to this regulation do not provide the best possible education for all students.

Technology Is General Education for ALL Students
Therefore, this proposed regulatory change in the middle school program requirements is NOT in the best interests of ALL children in NYS.

Technology Education is for **ALL** students regardless of future endeavors, whereas other CTE areas such as Agriculture, Health Occupations, Business Education and/or Trade & Technical Education applies to specific career training in those areas.

> In 1986, CR 100.4 defined Technology Education as a "program of instruction designed to assist **ALL** students in meeting State intermediate standards for technology. Technology education uses concepts of science, mathematics, social science, and language arts in a hands-on, systems-based approach to problem solving that guides students in the understanding, design and development of systems, devices and products to serve human needs and wants."

Students learn valuable skills and make real-world connections in NYS Technology Education classes.
The results of 12 years of students self-reported data below, boast their Technology Education experiences:
> 83% deem their design and creative skills increased
> 83% of students create projects utilizing math knowledge & skills
> 82% of students have worked in teams on projects
> 67% of student say their leadership skills have increased
> 73% of students create projects utilizing science knowledge & skills
> 77% are more aware of engineering and many other technical careers now

This proposed regulatory change may create an environment where students will not have the opportunity for an education that meets the NYS MST Learning Standard 5 in Technology Education.
In 1996, Technology Education was identified in the NYS Learning Standard area consisting of Mathematics, Science, and Technology.
> If a school district's responsibility is to offer a free & equitable educational experience that leads to the attainment of all 28 Learning Standards, than Technology Education must be required and taught.

Technology education provides the transferable skills that the workforce is demanding.
Business & Industry partners all over NYS support the broad based, flexible thinking, and STEM skills students learn in Technology Education.

"As new types of jobs emerge and new industries are created, new problems requiring solutions are encountered. To remain competitive, our nation needs flexible STEM-capable workers at every education level" (National Science Board, 2015, p.5).

A U.S. Commerce Department Committee proclaimed that "Science, technology, engineering and mathematics workers play a key role in the sustained growth and stability of the U.S. economy, and are a critical component to helping the U.S. win the future" (Langdon, McKittrick, et al., 2011).

A myriad of education, policy, and business groups have also strongly suggested expansion of STEM education (e.g., AAAS 1990, 1993; Carnegie Corporation 2009; Council on Competitiveness 2005; NCMSTC 2000; NGA 2007; NRC 1996, NRC 2007a, NRC 2012a; NSB 2007; PCAST 2012).

US Department of Education defines STEM education programs as "those primarily intended to provide support for, or to strengthen, science, technology, engineering, or mathematics (STEM) education at the elementary and secondary through postgraduate levels, including adult education." (US DOE, Report of the Academic Competitiveness Council, 2007, p. 10).

Shortage of Teachers Is Systemic
A shortage of certified teachers exists for ALL CTE as well as in many other areas.
Removing the technology education programmatic requirement creates an environment with limited confidence in the occupational outlook of the technology teaching profession. Creating a more stable and welcoming teaching environment that promotes job confidence will reignite interest for teaching as a profession.

- Interest in teaching as a profession has been declining since 2004 due to lack of funding for hiring and higher pay in certain districts and similar non-teaching areas. Grants, loan forgiveness programs, and changes in certification requirements seems to have made slight changes in teacher shortages nationwide.

- In an annual national survey of college freshmen, only 4.2% of students indicated their probable field of study would be education. This is fewer than half the share who expressed interest in 2007, when 9.2% of students intended to major in education, and the lowest proportion of students considering teaching in the last 45 years.

Trade & Technical and Health Occupations certification titles require significantly less pedagogical training than Technology Education.
Technology Ed & Family and Consumer Science certifications requires extensive training in pedagogy & content knowledge.

The Board of Regents has adopted the proposed amendment to Section 80-3.5 of the Commissioner's Regulations on certifying Trade & Technical and Health Occupations teachers. These certification pathways require no pedagogy training at all and specifically not for the unique nature of middle school students.

Why keep the Technology Education Requirement?
Technology Education is different than other subject areas and is irreplaceable in a child's education.

> *"We need to be explicit about what we mean by engineering and technology. Technology, the broader of the two disciplines, encompasses the way humans develop, realize, and use (and evaluate) all sorts of artifacts, systems, and processes to improve the quality of life. Technological literacy is what people need to live in, and control, the technological environment that surrounds us. This literacy comprises practical knowledge, reasoning skills, and attitudes. Engineering is more limited. It encompasses the professions that are concerned with the development and realization of such artifacts, systems, and processes. Engineering and technology education has long been delivered in two ways: through general education and through vocational education. In general education, the focus historically has been on practical (craft) skills. However, this emphasis has changed in most countries: traditional school subjects have been replaced by what is generally called "technology education." The main purpose of technology education is developing technological literacy, but in some cases a vocational element remains. In vocational education, the focus has been on preparing for a career in the commerce or in technical areas. This kind of teaching has focused on specific knowledge and skills. The latest development is that engineering has been accorded a more substantial place in general (technology) education. This shift is combined with the integration of science and math and leads to what is known as science, technology, engineering, and mathematics (STEM) education. Our use of the term* engineering and technology

education (ETE) relates to these contemporary developments and characterizes ETE as important and valuable for all students."

The proposed change in regulation would create a potential situation where students would be denied the opportunity to achieve Technological and STEM literacy. We live in an ever-evolving technological world, and Technology Education teaches the necessary technological literacy skills for the 21st century. Creating a regulatory environment where schools may eliminate Technology Education is a disservice to all our students present and future.

NYSTEEA Professional Recommendation

Retain the mandate for 1 unit of Technology and .75 units of Family and Consumer Science education. If after a thorough search for a certified teacher is conducted and the district is unsuccessful, then they would have the option to hire another CTE content area teacher to teach within their content area.

In our professional opinion, the best course of action is to leave the mandate 100.4, c, 1, v Program Requirements as is, while adding the clause stated above.
- NYSTEEA will work with SED and the other five CTE content areas to develop a 5 week comprehensive "Intro to CTE" curriculum that can be taught as an addendum to Technology and FACS classes.
- NYSTEEA will work with SED, ITEEA, as well as business and industry to ensure that current and relevant middle school Technology and Engineering curriculum is available.
- NYSTEEA, being CTLE certified, will promote and organize high quality professional development opportunities to T&E educators across the state.

Please contact info@nysteea.org with any further questions.

Thank you in advance,
Liz Gallo
President
NYS Technology & Engineering Educators Association