States are increasingly interested in finding ways to deliver and teach college- and career-ready content beyond traditional academic sequences. In a number of the states with college- and career-ready graduation requirements, their legislative or regulatory language explicitly requires students to complete certain academic courses (such as Algebra II) or their equivalents to ensure all students have multiple – but equally rigorous – pathways to completing the raised graduation requirements. It is within this context that “integration” has become a buzzword for the blending of academic and technical content. Beyond developing “partially” or “fully” integrated CTE/academic courses that offer credit towards CTE, elective and/or academic requirements, there are other ways in which states can begin to integrate academic and technical coursework – without sacrificing the rigor or the relevance of either. Below are four strategies for integrating CTE and academics, each of which has its own implications for students, teachers and education systems.

<table>
<thead>
<tr>
<th>COORDINATED COURSES</th>
<th>COORDINATED PEDAGOGY</th>
<th>PARTIAL INTEGRATION</th>
<th>FULL INTEGRATION</th>
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<td><strong>POTENTIAL STRATEGIES:</strong></td>
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<td>• Programs of Study</td>
<td>• Crosswalk of CTE and academic standards to identify and increase overlap in content/expectations</td>
<td>• Double courses</td>
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<td>• Interdisciplinary Assignments/ Activities</td>
<td>• Curriculum mapping</td>
<td>• Blended instruction</td>
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<td>EXAMPLE: A Health Science Career Academy that requires students to complete sequences of both CTE and academic courses that takes advantage of interdisciplinary lessons and assignments (such as a presentation that relies on knowledge and skills drawn from a student’s English, math social studies, and health science classes) to connect academic and technical instruction and learning.</td>
<td>EXAMPLE: Math-in-CTE is a program that brings together CTE and math teachers to identify, enhance and teach the math that is naturally embedded within CTE content through: • Mapping the curriculum; • Creating math-enhanced lessons; • Developing a scope and sequence; • Teaching the lessons and revising them as necessary; • Utilizing technical assistance along the way.</td>
<td>EXAMPLE: An engineering course that awards students credit in either or both CTE and an academic elective (rather than counting towards a specific science requirement, such as Physics). The credit(s) may be accepted for graduation and admissions to postsecondary institutions. Most Project Lead the Way courses meet this definition.</td>
<td>EXAMPLE: A construction/geometry class that awards students credits in both CTE and mathematics (counting towards a specific geometry requirement). Both credits may be accepted for graduation and admissions to postsecondary institutions. The UC System has validated over 9,000 high school CTE courses as meeting their admissions requirements in the core academic areas or as an academic elective.</td>
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APPROACHES TO INTEGRATING ACADEMIC AND TECHNICAL STUDIES

COORDINATED COURSES

**BARRIERS:**
- Requires substantial co-planning between and across disciplines
- Requires deliberate scheduling to ensure students are taking complementary academic and technical courses.

**SUPPORTIVE STATE ACTIVITIES:**
- Support for Career Academies, including model curricula, supportive legislation
- Collect and disseminate best practices for teacher planning time

COORDINATED PEDAGOGY

**BARRIERS:**
- Requires substantial professional development/training to ensure reinforcement is understood by all teachers and occurring in classrooms
- Requires systemic implementation to ensure full commitment across and within disciplines

**SUPPORTIVE STATE ACTIVITIES:**
- Coordinated professional development opportunities for both CTE and academic teachers
- Model lesson plans that demonstrate how CTE concepts relate to academic concepts and vice versa
- Develop/support the creation of a "glossary" that crosswalks common CTE and academic terms

PARTIAL INTEGRATION

**BARRIERS:**
- The sheer volume of CTE courses and programs of study
- Requires articulation agreements with higher education
- Bringing courses to scale

**SUPPORTIVE STATE ACTIVITIES:**
- Develop model integrated courses/curriculum (at the state level or by validating locally-developed courses)
- Create common transcripts, with support from higher education system
- Create processes by which higher education validates integrated courses

FULL INTEGRATION

**BARRIERS:**
- The sheer volume of CTE courses and programs of study
- Requires articulation agreements with higher education
- Teacher certification (e.g., lack of dual certification in academic and CTE disciplines)
- Bringing courses to scale

**SUPPORTIVE STATE ACTIVITIES:**
- Support for Career Academies, including model curricula, supportive legislation
- Collect and disseminate best practices for teacher planning time
- Develop/support the creation of a "glossary" that crosswalks common CTE and academic terms
- Create common transcripts, with support from higher education system
- Create processes by which higher education validates integrated courses
- Create teacher prep programs that offer in dual certifications (e.g., applied math).