

Career Pathways for the 21st Century

Preparing Students for a Technologically-
Advanced, Global Workforce



A Technical Assistance Guide for Delaware School Districts

Delaware Department of Education
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State Board of Education

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Career Pathways for the 21st Century: A Technical Assistance Guide

Introduction

In 2009, the State of Delaware joined the New Commission on the Skills of the American Workforce, a consortium of states implementing “Tough Choices or Tough Times.” Governor Markell stated, “Education is the most critical investment a society can make in its future.” The future of which Markell speaks is one in which “a very high level of preparation in reading, writing, speaking, mathematics, science, literature, history and the arts will be an indispensable foundation for everything that comes after for most members of the workforce. It is a world in which comfort with ideas and abstractions is the passport to a good job, in which creativity and innovation are the key to the good life, in which high levels of education—a very different kind of education than most of us have had—are going to be the only security there is” (Tough Choices or Tough Times Executive Summary, pp. 6-7).

Recent studies have also shown that “combining academic rigor with career and technical learning (provided through the school), work-based learning (provided through a business in the community), and specific guidance or mentoring designed to help the student move toward postsecondary goals not only improves graduation rates but also helps boost scores in reading, mathematics and science” (Aratani, 2006; Bottoms, 2003).

Regulation 505 High School Graduation Requirements and Diplomas

In 2006, the Delaware State Board of Education adopted more rigorous graduation requirements to ensure that Delaware students have the skills and knowledge they need to compete with peers at home and around the globe. According to [Regulation 505](#), beginning with the graduating class of 2011, a public school student shall be granted a State of Delaware Diploma when such student has successfully completed a minimum of twenty two (22) credits including three (3) credits in a **Career Pathway**. *For more detail on High School Graduation Requirements and Diplomas for graduates of 2015, read the remainder of Regulation 505.*

A **Career Pathway** is defined as three (3) credits of pre-planned and sequential courses required for graduation designed to develop knowledge and skills in a particular career or academic area. The Career Pathway shall be included in the Student Success Plan. Career Pathways must contain the essential elements listed below:

- Be planned, sequential courses—beyond those required for graduation—that provide academic and career-related knowledge and skills in a chosen career pathway;
- Meets state academic and/or Career and Technical standards and grade-level expectations;
- Provides additional preparation to assure high skill, high wage workplace or college readiness.

Career pathways are not intended to narrow a student’s opportunity for growth, but rather to ensure that the students and their parents fully utilize the high school experience for purposeful, substantive learning.

Purpose

Regulation 505 states that, “Local school districts and charter school boards shall establish policies concerning the purpose, content, development and approval of Career Pathways.” This technical assistance manual is designed to help school districts and charter boards to design appropriate and effective career pathways by:

- Providing illustrative examples of both Career and Technical Education (CTE) Pathways, Academically-Focused Career (AFC) Pathways and Integrated Career Pathways (ICP);
- Establishing a protocol for designing AFC Pathways;
- Highlighting the benefits to students when they take part in well-designed career pathways;
- Providing technical assistance to districts and charter schools for the creation and implementation of career pathways.

Career Pathways

Career pathway is a general term for all pathways meeting the Delaware graduation requirements. The Career Pathway graduation requirement can be filled by completing either a Career and Technical Education (CTE) Pathway, an Academically-Focused Career (AFC) Pathway or a combination of the two (Integrated Career Pathway). A Delaware career pathway is defined as the three credits of planned and sequential courses designed to develop knowledge and skills in a particular career or academic area. It is a pre-planned, sequential, and approved program of study. Career pathways should provide students effective technical and academic preparation for entry into high-skill, high-wage, and high-demand occupations while preparing for postsecondary learning.

A planned and sequential career pathway is a set of three (3) or more courses that must:

- Incorporate secondary education and postsecondary elements;
- Not otherwise be taken to fulfill graduation requirements;
- Include academic and career and technical content in a coordinated, non-duplicative progression of courses;
- Lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or bachelor's degree; and
- Fall under one of the 16 Career Cluster designations:

• Agriculture, Food and Natural Resources	• Hospitality & Tourism
• Architecture & Construction	• Human Services

<ul style="list-style-type: none"> • Arts, A/V Technology and Communication 	<ul style="list-style-type: none"> • Information Services
<ul style="list-style-type: none"> • Business, Management & Administration 	<ul style="list-style-type: none"> • Law, Public Safety & Security
<ul style="list-style-type: none"> • Education and Training 	<ul style="list-style-type: none"> • Manufacturing
<ul style="list-style-type: none"> • Finance 	<ul style="list-style-type: none"> • Marketing, Sales & Service
<ul style="list-style-type: none"> • Government & Public Administration 	<ul style="list-style-type: none"> • Science, Engineering, Technology and Math (STEM)
<ul style="list-style-type: none"> • Health Science 	<ul style="list-style-type: none"> • Transportation, Distribution and Logistics

See <http://www.careerclusters.org/16clusters.cfm> for more information on career clusters.

CTE Pathways

Career and Technical Education (CTE) Pathways are a subset of Career Pathways that are specific within Career & Technical Education programs, and meet special requirements under federal Carl D. Perkins legislation and state Career & Technical Education legislation and regulations. These pathways must be approved by the Delaware Department of Education in order to receive federal and state funds. CTE Pathways are defined within the structure of CTE content areas including: AgriScience; Business, Finance and Marketing; Family and Consumer Sciences; Skilled and Technical Sciences; and Technology Education. Career and Technical Education (CTE) prepares students for employment and/or postsecondary education in current or emerging professions. See sample CTE Pathways below on page 5. See the [complete list of approved CTE Pathways](#).

AFC Pathways

Academically-Focused Career (AFC) Pathways are a subset of Career Pathways that utilize academic content in a way that builds knowledge and skills to help students prepare for a chosen career. AFC Pathways should be developed in consultation with the student and should be based on his/her interests and career skill inventory results from Career Cruising. These AFC pathways should be designed to help students build background knowledge for a postsecondary career. AFC Pathways may look very different in high schools across the state because they must be comprised of three academic courses above and beyond those required for graduation. This means that the electives may vary considerably from school to school in a variety of content areas, such as Social Studies, English Language Arts, and World Languages. See some possible AFC Pathways on page 6.

Integrated Career Pathways (ICP) and Science, Technology, Engineering and Math (STEM)

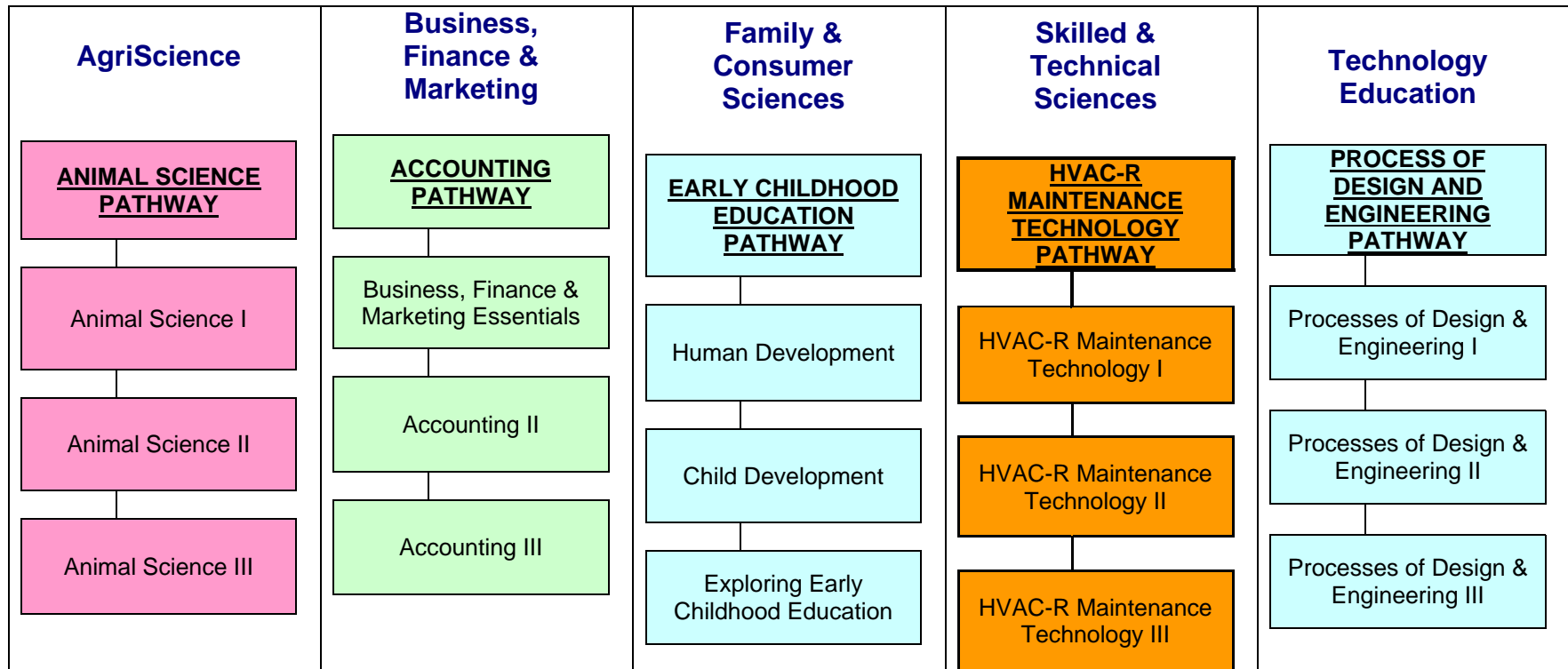
An *Integrated Career Pathway (ICP)* is a three credit pathway that consists of courses from multiple CTE pathways or a blend of academic and CTE courses that are a planned and sequential program of study. For example, an ICP may consist of Science, Technology, Engineering, and Math (STEM) courses. STEM Pathways may be purely CTE or AFC Pathways but they are great platforms to integrate academic and Career and Technical Education courses in a way that prepares students to acquire highly-valued skills and innovatively problem-solve real world challenges. The science, technology, engineering, and mathematics courses are connected so that the practical application of science and mathematics are acquired through technology and engineering. Pathway courses in science, agriscience, technology, engineering, or mathematics engage learners in inquiry investigations, conceptual and applied knowledge, and engineering design processes.

STEM, like all pathway courses, at the school level should demonstrate these core values:

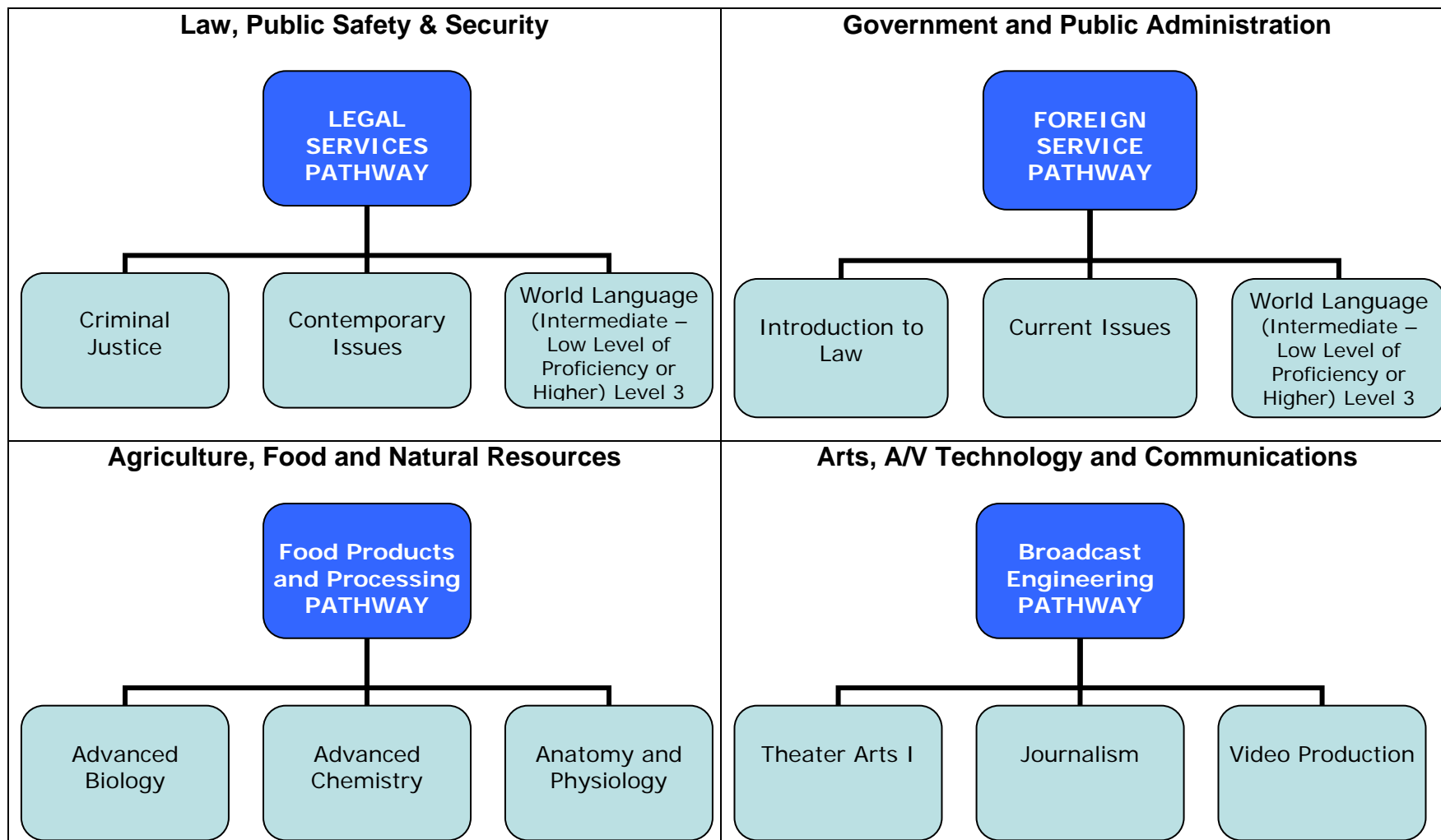
- *Standards:* Alignment to the vertical progression of core concepts inherent in the Delaware Content Standards in terms of rigor and expectations.
- *Inquiry-learning:* Promotion of skills that support inquiry, innovation, collaboration, communication and problem-solving.
- *Interdisciplinary approach:* Promotion of interdisciplinary learning that supports abstract thought, team-building experiences, and self-directed learning tied to real-world experiences.
- *Course grouping:* Grouping of pathway courses by the knowledge and skills required of occupations in career fields. Each STEM pathway should provide the foundation necessary to become successful in any of several careers and educational pursuits.

A district may select some combination of AFC and CTE courses to craft a pathway for students. (See some possible Integrated Career Pathways on page 7, including two STEM Pathways for Biotechnology and Environmental Engineering. The orange blocks represent CTE areas and the light blue ones AFC.) Biotechnology is the integration of biology and technology to solve diverse societal problems in areas such as genetics, crop growth and production, food animal growth and production, and biofuels. Environmental engineering applies knowledge and skills in environmental science and technology to solve diverse environmental issues involving the air, water, and land in order to improve the health of the environment and inhabitants thereof. See a Sample High School Program of Studies for Completing an ICP Pathway in STEM—Environmental Engineering on page 8.

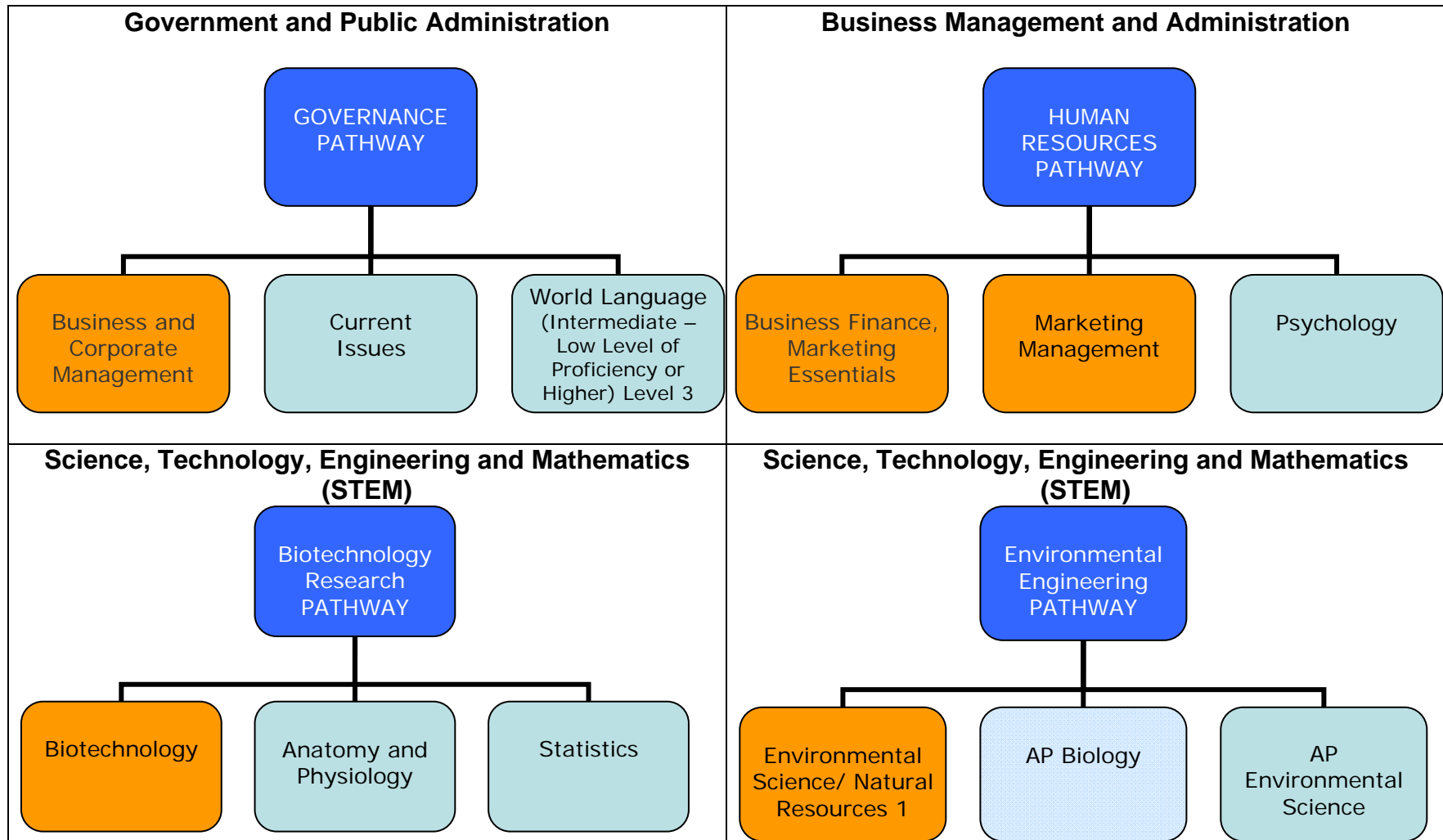
EXAMPLES OF APPROVED CTE PATHWAYS



POSSIBLE AFC PATHWAYS



POSSIBLE INTEGRATED PATHWAYS



Sample High School Program of Studies for Student Completing an ICP Pathway in STEM—Environmental Engineering (Year 2015)

This Integrated Career Pathway illustrates an Environmental Engineering Pathway of the Science, Engineering, Technology and Math (STEM) Career Cluster. The courses listed below are only samples and should be individualized to meet each learner's educational and career goals. A variety of other electives are possible.

Required Credits	Grade 9	Grade 10	Grade 11	Grade 12	College Program or Workforce Employment for Environmental Engineering
English (4)	English I	English II	English III	English IV	University of Delaware: Bachelor of Environmental Engineering, 4 years Delaware Technical and Community College: Environmental Technology Program Jobs: Air Pollution Engineer Coastal Management Water Resources Engineer Environmental Engineer
Social Studies (3)	Civics/ Geography	Economics	US History	World History	
Mathematics (4)	Algebra I or Integrated I	Geometry or Integrated II	Algebra II or Integrated III	Statistics	
Science (3)	Integrated Physical and Earth Science	Biology	Chemistry		
PE (1)	PE (0.5)	PE (0.5)			
World Languages (2)	World Language	World Language	World Language	World Language	
Health (0.5)	Health (0.5)				
Electives (3.5)	Drafting and Design-CAD 1 (CTE)	Driver's Ed (0.5)	Visual & Performing Arts	Visual & Performing Arts	
<u>Integrated Career Pathway</u>		Environmental Science/ Natural Resources (CTE)	AP Biology	AP Environmental Science	

Required courses are highlighted in yellow, electives in green and the Required Career Pathway in red.

How to design Academically-Focused or Integrated Career Pathways

Academically-Focused Career Pathways provide opportunities for students to plan participation in a series of courses beyond those needed for graduation in order to focus on possible future education and work. Pathways may differ from one another depending on the content areas included in the cluster. For instance, an Academically-Focused Career Pathway in Journalism could include courses such as creative writing, journalism and web design. Any courses required to meet the Delaware graduation requirement may not be used. On the other hand, all courses in the arts are considered electives and eligible for inclusion in a course sequence for an Academically-Focused Career Pathway. Most content areas offer courses to meet graduation requirements and elective courses that may be sequenced together into an Academically-Focused Career Pathway.

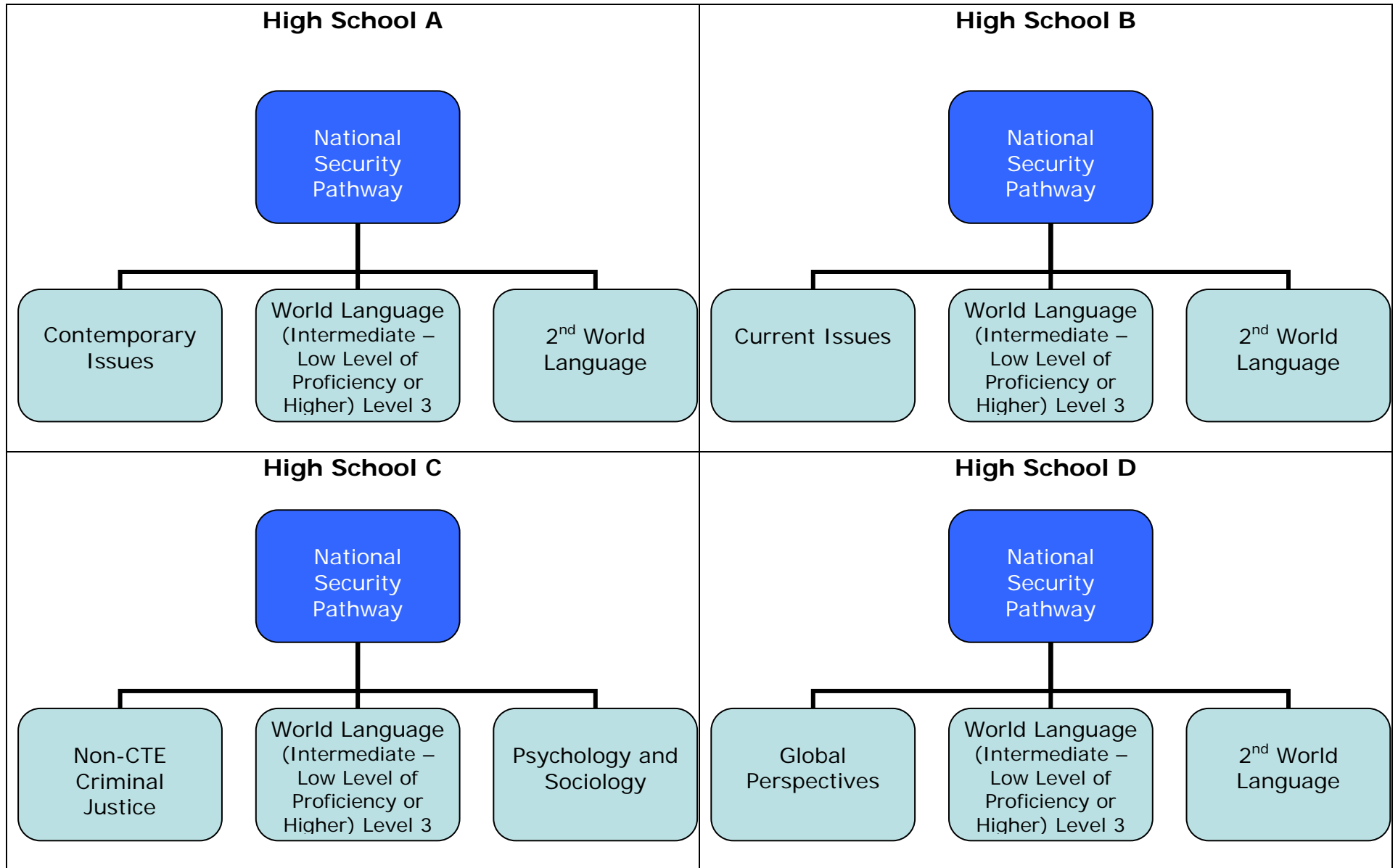
The Development of Academically-Focused or Integrated Career Pathways may be approached in this way:

Steps Guidance May Take	Steps Students May Take (An Illustrative Scenario)
1. Analyze the student career interest data from Career Cruising . Compare this interest data to entry data collected from college course catalogs in majors in which many students have previously enrolled.	<i>Michelle is a ninth grader who is interested in working for the CIA and this is reflected in the information she has entered into her Career Cruising profile. Michelle will now see how her interests align with college course catalogs.</i>
2. Determine the careers with the most student interest and examine those careers that are in high demand locally, regionally, and nationally. This information may be found at http://online.onetcenter.org . Align the careers with the most student interest to the clusters to which they belong. For more information go to Career Clusters or the Delaware Occupational and Labor Market site .	<i>Examining the high demand careers locally, regionally and nationally, it was discovered that the US government is the largest employer in the country and is currently seeking highly skilled individuals in the national security field. The National Security Pathway falls under the Government and Public Administration Career Cluster. Michelle is currently on the right path to obtain a job in field that is of high demand.</i>
3. Examine the elective course offerings and determine which ones may align to a chosen career.	<i>When Michelle examined the school's elective course offerings, she finds that there are several courses that could possibly provide knowledge and skills beneficial to her career pathway: current events, AP Government, the History of Wars, Cold War Politics, contemporary issues, languages, criminal justice, etc.</i>

<p>4. Compare student career demands with the academic electives offered.</p> <ul style="list-style-type: none"> • Ask these questions: <ul style="list-style-type: none"> ▪ Are the electives that are currently offered sufficient and general enough to provide needed information and skills to students with a wide array of career interests? ▪ Is there a demand for the course? ▪ Is there a real-world application that would generate student interest and help retain students in school (for example Psychology versus a course on the History of the War in Viet Nam)? 	<p><i>After a list of possible courses is generated, Michelle works with her Guidance Counselor to examine her list of possible academic courses in order to determine if they provide a broad enough base of information and skills to be useful for her career pathway. Courses like the History of War and Cold War Politics were determined to be too narrow in focus for a National Security Career Pathway.</i></p> <p><i>Michelle's Guidance Counselor consults with those in charge of designing pathways to revisit the skills necessary for National Security and determines that the courses that would be in highest demand and provide a more real-world context for Michelle would be contemporary issues, criminal justice and several world languages.</i></p>
<p>5. Determine which elective courses could be sequenced and pre-planned to lead to competencies needed in certain careers. Think of what courses could be offered rather than what is currently being offered. What new sequences might be developed as a result of this analysis?</p>	<p><i>Then it was decided that the most beneficial sequence of courses for Michelle's chosen pathway would be: criminal justice, a third level of one language (since two are already a requirement) and at least one level of an additional language.</i></p> <p><i>Michelle's Guidance Counselor analyzes Michelle's course sequence and considers whether Psychology and sociology should be offered in lieu of courses (History of War) that are currently offered.</i></p>
<p>6. Update and revise school course offerings based on data collection and analysis.</p>	<p><i>Based on data collected, this AFC pathway was then offered to Michelle and will become available to any other like-minded students.</i></p>

The following page highlights how the AFC pathways could look different at four different schools solely based on the electives offered at those schools.

The following is a sample of what a **National Security Pathway** in the Government and Public Administration Cluster may look like in four different high schools depending on the electives that are offered in each one:



Benefits

Providing both career & technical pathways and academically focused pathways better prepares students for future careers. They provide relevancy of the course work taken in high school for all students.

While in high school, students set their long term goals for college or the workforce. Students can tailor their high school course work to prepare for university requirements or for skilled, technical work immediately after high school.

According to [Delaware's Reaching High for Student Success](#) statement, "*The United States has one of the lowest high school graduation rates in the industrialized world. Nearly one million students drop out of school every year in this country, and almost half of all African Americans, Hispanics and Native Americans fail to graduate. In Delaware, 1,995 students dropped out of high school during the 2005-2006 school years. Research shows that dropouts are more likely than high school graduates to be unemployed, in poor health, living in poverty, in prison, on public assistance, and to have children who also drop out of high school. Many who do graduate from high school find that the jobs they are seeking require more sophisticated skills and knowledge. Businesses are looking for employees who can write and communicate clearly, analyze information, conduct research and solve complex problems. The majority of jobs in the labor market now require at least some postsecondary education, and students must be prepared for the increased demands of college-level work. Whether heading to jobs or college, Delaware students are facing higher expectations and our public schools must ensure that they receive the instruction and support necessary to meet those expectations.*"

Providing focused Career Pathways can help reduce the drop out rate by helping students see that course selection is a meaningful, purposeful process.

The State of Delaware has worked toward providing tools to ensure that students are prepared for success. To help students determine if they will be taking a CTE pathway, an AFC pathway, or IC pathway they will develop a Student Success Plan (SSP). The Delaware Department of Education's [Plan for the Future Resource Guide for Families](#) explains the tool available as a part of the SSP to support career development – Career Cruising: "Career Cruising is an internet-based career exploration and planning tool that students use to explore career and school options and develop a career plan. While online, students can use this tool to learn about the different options for work, technical training, and postsecondary education; research the most up-to-date career information available; find out what careers are in demand in Delaware and nationally; research colleges, universities and scholarship opportunities; read real-word interviews from someone in your career of interest; and find out how to prepare for a chosen career."

The overarching goal of Delaware's career pathways is to prepare students for the globally competitive world of the 21st century, in essence for students to reach their goals successfully. High schools should provide a personalized learning environment where students can see the relevancy of their daily assignments to their future career goals. Through the effective use of career pathways determined by the Student Success Plans, our high school drop out rate should decrease and our future workforce should become better prepared for life after high school.

How can the DDOE support the creation and Implementation of Career Pathways?

The Delaware Department of Education is dedicated to helping districts and charter schools develop high-quality career pathways. Those who are in charge of this project may contact the Delaware Department of Education for technical assistance during the planning and/or implementation of the pathways. For technical assistance regarding CTE pathways, contact Lisa Stoner-Torbert (lstoner@doe.k12.de.us) or Gregory Fulkerson (gfulkerson@doe.k12.de.us) for AFC pathways.

The Delaware Department of Education may provide funding and training for teachers and counselors so that they may better understand AFC and integrated pathways. For those districts interested in developing more STEM-focused integrated pathways, the Department will provide specialized technical assistance. Contact Karen Hutchison (khutchison@doe.k12.de.us), Diana Roscoe (droscoe@doe.k12.de.us) or Kelli Martin (kmartin@doe.k12.de.us) for additional information.

Counselors seeking additional technical assistance may contact Dennis Rozumalski (drozumalski@doe.k12.de.us).

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