Career Clusters +
Career Pathways +
Competency Models =
Education-Workforce Alignment
Resulting In...
A Program of Study

An approach that discusses career clusters, career pathways, and competency models in a relationship perspective.
Programs of Study are the Foundational Centerpiece of Career Preparation

(Many would say our best CTE programs have been Programs of Study for years)

IF IT LOOKS LIKE A DUCK
AND QUACKS LIKE A DUCK, IT'S A DUCK

IF David Letterman had a Top Ten for POS/TSA

10. I’m comfortable with what I’ve always done.
9. I don’t have a relationship with post-secondary.
8. Students like the courses we have right now.
7. I don’t have time for the extra work.
6. If I can wait this out, it too will go away.
5. When pigs fly. 
4. I don’t have industry experts.
3. Advisory committees are rubber stamps.
2. What do I use for standards and assessments?
1. We can’t afford the cost.
CTE Program Development

• Postsecondary institutions are reactive to industry and economic development conditions in the regions they represent.
  – When considering program development, they look at industry sector issues relating to:
    • Labor Market Information (LMI)
    • Existing Skills of the workforce
    • Career guidance and exploration
    • Education and Training considerations
• Secondary schools should offer programs that prepare student to link to one or more postsecondary programs through secondary-postsecondary CTE Programs of Study.

WHAT IS A PROGRAM OF STUDY?
CTE Program of Study (POS)

A program of study is a comprehensive, structured approach for delivering academic and career and technical education to prepare students for postsecondary education and career success.

- U.S. Department of Education Operational Definition

Program of Study (Perkins IV)

- Incorporate and align secondary and postsecondary education elements,
- Include academic and CTE content in a coordinated, non-duplicative progression of courses,
- Offer the opportunity, where appropriate, for secondary students to acquire postsecondary credits, and
- Lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree.
PROGRAM OF STUDY DESIGN FRAMEWORK

"A program of study is a comprehensive, structured approach for delivering academic and career and technical education to prepare students for postsecondary education and career success." - Operational definition

- Legislation and Policies
- Accountability and Evaluation Systems
- Secondary Level
  - Guidance and Counseling
    - Course Offering
    - Credit Transfer Agreements
  - Technical Skills Assessment
- Postsecondary Level
  - Professional Development
  - Partnership
    - College and Career Readiness Standards
- Common Career Technical Core
- Foundational Academic Expectations/ Common Core Skills/ Foundational Skills
- Pathway Knowledge & Skills
- Cluster (Foundational) Knowledge & Skills
- Essential Knowledge & Skills
- 21st Century Skills
- Specialties Certifications, and Advanced Degrees
Career Ready Components in Programs of Study are Standards-Driven

**ACADEMIC SKILLS**
- Iowa Core – Integration of Science, Technology, Engineering, Math, Communications, etc.

**EMPLOYABILITY SKILLS**
- 21st Century Skills – Integration of 21st Century Skills, SCANS skills, etc.

**TECHNICAL SKILLS**
- Technical Skills – Adoption of approved S&B, Tech Skills Attainment Assessments, etc.

Technical Skill Standards

Association for Career and Technical Education. What is Career Ready? Downloaded from: https://www.acteonline.org/WorkArea/DownloadAsset.aspx?id=2114
Career Ladders and Lattices

Career ladders consist of a group of related jobs that make up a career. They often include a pictorial representation of job progression in a career, as well as detailed descriptions of the jobs and the experiences that facilitate movement between jobs. Career ladders display vertical movement between jobs. Career Lattices are horizontal movement between jobs.

It's important that students learn about the career ladder and lattices that exists within an industry, so that they can plan their career path.
Industry and Occupation

Main

The U.S. Census Bureau currently collects data on industry, occupation, and class of worker for Americans in the labor force on several surveys. The American Community Survey (ACS), the Current Population Survey (CPS), and the Survey of Income and Program Participation (SIPP) are the largest ones. In addition, industry and occupation data are collected on a number of other surveys conducted on behalf of external sponsors. These data cover the type of business conducted by a person’s employer, the ownership of that business, and the specific kind of work that that person performs. Prior to the 2010 Census, data on industry, occupation, and class of worker were also collected on the decennial long-form.

Click here to access Code Lists and Crosswalks

Click here to access Industry and Occupation Indexes

Latest Releases

Full-Time, Year-Round Workers and Median Earnings in the Past 12 Months by Sex and Detailed Occupation: 2013 (XLSX - 111K)

Employment Transitions among the Self-Employed during the Great...
Technical Skill Attainment -- Postsecondary

- Sec 113 (b)(2)(B)
- “…core indicators of performance…that are valid and reliable…measures of each of the following:”
- “Student attainment of career and technical skill proficiencies, including student achievement on technical assessments, that are aligned with industry-recognized standards, if available and appropriate.”
- “Student attainment of an industry-recognized credential, a certificate, or a degree.”

Points for Accuracy – Where do you want to end up?
Program Alignment – Standards & Assessments

Training students to industry standards assures that their skills will be on target with what industry requires for workers to be successful.

What are Barriers to Schools and Colleges Aligning Curriculum/Assessments with Industry Standards?

1. Is postsecondary and secondary leadership committed to it?
2. Is the facility equipped for it?
3. Are instructors adequately trained?
4. Do programs have strong Industry Advisory Committees?
5. Has a plan been developed for achieving alignment with industry standards?
6. Have resources been dedicated to support the effort.
What if colleges and schools are not at a point where they can align curriculum and assessments with industry standards?

They should develop a plan for taking incremental steps to work toward aligning curriculum and assessments through a Continuum Approach:

• The next ten slides describe the continuum approach.

Secondary to Postsecondary Program of Study
Skillset-Standards Partnership
(With NCRC, WorkKeys, and KeyTrain Integration)

CTE Program Standards are aligned between High School and Community College Programs by “Beginning the With the End in Mind,” and Working Backward From Community College Program Standards to Develop a Subset of High School Program Standards. CTE courses are mapped for academic integration of math, literacy, and science into each course.

(Begin With the End in Mind and Work Backward to develop subset of standards for Secondary)
Continuum Approach

1. Establish where the Community College/Postsecondary program is on the continuum toward nationally-recognized standards.
2. Define what the Community College/Postsecondary program is using for
   A. “Student attainment of challenging career and technical skill proficiencies, including student achievement on technical assessments that are aligned with industry-recognized standards, if available and appropriate.” and
   B. “Student attainment of an industry-recognized credential, a certificate, or a degree.”
3. Formalize the Community College/Postsecondary Program Standards.
4. Define what assessments the Community College program is using to collect valid and reliable data.

Continuum Approach

5. Define the Community College/Postsecondary – high school partnerships necessary to align standards, courses and program continuity.
6. Community College/Postsecondary and High School programs partner together, working backward from the Community College/Postsecondary program standards at program completion - to develop a subset of standards that will become the High School program standards.
7. Community College/Postsecondary and High School programs partner together to review high school program courses and course content to identify and plan revisions – strategic plan is written.
8. Community College/Postsecondary and High School programs partner together to define the assessments that the High School program will use to collect valid and reliable data.
Continuum Toward Industry-Recognized Standards

Beginning
• Program standards and benchmarks approved by a 3rd party – advisory committee and/or community college/postsecondary

Intermediate
• State standards and benchmarks approved by a statewide committee of industry representatives that include subject matter experts.
• Program standards and benchmarks approved by a 3rd party – advisory committee and/or community college/postsecondary

Advanced
• Nationally validated industry-based standards.
• Include written and performance technical assessments.
• Developed by industry subject matter experts.
• Tied to industry association certification.

High School Program Standards and Assessments Process

• Development of a linear alignment between High School and Community College/Postsecondary program standards and assessments.
• Oversight and approval by High School and Community College/Postsecondary program advisory committees.
• Development of a strategic plan for program improvement and progress along the continuum.
Validity

Joppe (2000) provides the following explanation of what validity is in quantitative research: Validity determines whether the research truly measures what it was intended to measure or how truthful the research results are. In other words, does the research instrument allow you to hit "the bull's eye" of your research object? Researchers generally determine validity by asking a series of questions, and will often look for the answers in the research of others. (p. 1)

Reliability

- Joppe (2000) defines reliability as: ...The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. (p. 1)

- Kirk and Miller (1986) identify three types of reliability referred to in quantitative research, which relate to: (1) the degree to which a measurement, given repeatedly, remains the same (2) the stability of a measurement over time; and (3) the similarity of measurements within a given time period (pp. 41-42).


Validity and Reliability

- The position of schools and colleges in adopting standards and assessments range over the continuum – requiring flexibility in defining the interpretation of valid and reliable.
### Requires a Valid and Reliable Continuum

**Beginning**
- **Validity** – Ensure that assessments align with standards and benchmarks. Align test questions with goals and objectives.
- **Reliability** – Ensure that different teachers score students in a similar manner. Use a sufficient number of test items.

**Intermediate**
- **Validity** – State or regional assessments are developed and tested to determine that the assessments measure what they supposed to measure. Multiple assessments are utilized to measure the same learning objectives.
- **Reliability** – Assessments must generate reliable and consistent measurements of student skills and knowledge. The assessments measures should yield consistent results across different raters, different periods of time, and different samples of tasks.

**Advanced**
- **Validity** – According to The Standards for Educational and Psychological Testing (1999) the assessments used must demonstrate a high degree to which the sample of items, tasks, or questions on a test are representative of the defined universe or domain of the required skills in a given job title or occupation.
- **Reliability** – Assessments must generate reliable and consistent measurements of student skills and knowledge when calculated with statistical analysis programs, as well as demonstrate inter-rater reliability when different raters score the same population. (Using coefficient alpha (or KR-21,KR21) in large-scale testing)

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### What are Building Blocks and Structure of CTE Programs?

1. Career Clusters
2. Competency Models
3. Career Pathways
INTERRELATED AND INTERDEPENDENT

1. Career Clusters
2. Competency Models
3. Career Pathways

WHAT IS A CAREER CLUSTER?
Definition of a Career Cluster

- **Career Clusters** are groupings of occupations/career specialties used as an organizing tool for curriculum design and instruction. Occupations/career specialties are grouped into the Career Clusters based on the fact that they require a set of common knowledge and skills for career success.
  - *States' Career Clusters Initiative*

1. Career Clusters Resources

1. [Career Ready Practices](#)
2. [Common Career Technical Core, Programs of Study & Industry-Based Standards](#)
3. [Common Career Technical Core for the Manufacturing Career Cluster](#) (Example)
Rationale for a Broad-based Secondary Program

- The following slide shows the Manufacturing Career Cluster, its Pathways, and the many examples of occupations that are within each Pathway.
- Providing a broad-based secondary program prepares students to choose from a wider range of occupations within a career cluster.
National Association of State Directors of Career Technical Education Consortium (NASDCTEc)

http://www.careertech.org/career-clusters/resources/credentials.html

Credentials

A credential attests to the qualifications, competencies, or authority of an individual to perform at levels of proficiency established by a third party with the relevant or de facto authority and competence to do so. It is the ultimate demonstration of the knowledge and skills outlined in the Program of Study. For the CTE student, it is the culmination of his/her individual Plan of Study -- and the beginning of a lifelong career of achievement in his/her chosen field.

The credential listings provided below were revised in 2010 from the 2002 Career Cluster™ Resource Guide published by the National Career Technical Education Foundation (NCTEF). All were reviewed by the Career Cluster™ Leaders and/or the National Advisory Committee, with new credentials added only at their recommendation. They're organized by the 16 Career Clusters™ and divided into three primary sections:

1. Education and Industry Licenses
2. Education and Industry Certificates
3. Postsecondary Degree Options

Each section is organized by the type of program, the organization or type of school that offers the certification, license or degree and the source for contact information or further details on the program. These are samples of existing credentials and are not meant to be all-inclusive. They are provided here for informational purposes only and are not endorsed by NCTEF or the National Association of State Directors of Career Technical Education Consortium.

http://www.careertech.org/career-clusters/glance/cctc.html

Common Career Technical Core

The Common Career Technical Core (CCTC) is a state-led initiative to establish a set of rigorous, high-quality standards for Career Technical Education (CTE). The standards have been informed by state and industry standards and developed by a diverse group of teachers, business and industry experts, administrators and researchers.

The initiative is being coordinated by the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), which represents the state and territory leads of secondary, postsecondary and adult CTE across the nation. Twenty states (the District of Columbia and Palau) participated in the development stage of the CCTC.

The development of the CCTC was a multi-step process that incorporated input from approximately 3,000 individuals representing K-12 education, business and industry and higher education from across the nation.

The process for developing the CCTC was informed by:

• High-quality state and industry standards;
• Input and guidance from educators, business and industry and state leaders; and
• Feedback from the public.

The CCTC includes a set of standards for each of the 16 Career Clusters® and their corresponding Career Pathways that define what students should know and be able to do after completing instruction in a program of study. The CCTC also includes an overarching set of Career Ready Practices that apply to all programs of study. The Career Ready Practices include 12 statements that address the knowledge, skills and dispositions that are important to becoming career ready.

Download the CCTC here.
Common Career Technical Core (CCTC)

The NASDCTEc CCTC project is a state-led initiative informed by state and industry standards, and developed by a diverse group of teachers, business and industry experts, administrators, and researchers. Following are several of many resources to assist schools in developing high quality, rigorous CTE programs.

- All cluster Common Career Technical Core (CCTC) and Career Ready Practices.
- Programs of Study and Industry-Based Standards.

WHAT IS A COMPETENCY MODEL?
Definition of a Competency Model

- A competency model is a collection of competencies that together define successful performance in a particular work setting. Competency models are the foundation for important human resource functions such as recruitment and hiring, training and development, and performance management.

2. Competency Model Resources

1. Competency Model Clearinghouse
2. TECHNICAL ASSISTANCE GUIDE FOR DEVELOPING AND USING COMPETENCY MODELS: ONE SOLUTION FOR THE WORKFORCE DEVELOPMENT SYSTEM
Advanced Manufacturing Competency Model

Career Paths – Life Long Learning

High Quality Middle Class Jobs

Occupation-Specific Certifications

Entry Level Industry Certifications

Ready for Work, Ready for College

Occupation-Related: High-demand occupations are matched with critical industry certifications in such areas as machining, welding, fabrication, automation, fluid power, mechatronics, transportation/distribution, and logistics. At the top of the model are managerial and specialty occupations, including engineering.

Core Technical: Core technical skills that impact the bottom line include safety, quality and measurement, maintenance installation and repair, production, and sustainable manufacturing.

Foundational: Basic skills that cut across all sectors in manufacturing include:

- **Workplace competencies**: Do workers use critical thinking skills, work in teams, and have problem solving skills?
- **Basic applied skills in reading, writing, math, and locating information**: Can workers communicate effectively, follow key instructions, and read manuals?
- **Personal effectiveness**: Will prospective employees show up on time, be dependable, and demonstrate initiative?
### Stackable Certifications to Achieve Workforce-Education Alignment

**Alignment Exist for Competency Model Structures and Career Pathways Through the Career Clusters Framework.**

While the stackable certification structure is consistent and aligns between industries, the Industry Standards and Coursework that make up the Program of Study are industry specific.

<table>
<thead>
<tr>
<th>Advanced Manufacturing Competency Model</th>
<th>Career Clusters Framework for the 16 National Career Clusters</th>
<th>Workforce-Education Alignment Career Pathways</th>
</tr>
</thead>
</table>

A career pathway outlines a sequence of work experience, education and/or training activities needed to secure a job and advance over time to successively higher levels of employment. Competency models identify the foundation, academic, and industry technical competencies required to:

- Identify the education and training required.
- Progress up a career ladder.
- Move along a career lattice.

(CareerOneStop Competency Model TAG)

From: Career Pathways Toolkit - Initiative Career pathway-oriented workforce development has the goal of increasing individuals' educational and skills attainment and improving their employment outcomes while meeting the needs of local employers and growing sectors and industries.

(Social Policy Research Associates under USDOL-ETA grant)
WHAT IS A CAREER PATHWAY?

Definition of a Career Pathway

• A Career Pathway is a coherent, articulated sequence of rigorous academic and career/technical courses, commencing in the ninth grade and leading to an associate degree, baccalaureate degree and beyond, an industry recognized certificate, and/or licensure. The Career Pathway is developed, implemented, and maintained in partnership among secondary and postsecondary education, business, and employers. Career Pathways are available to all students, including adult learners, and lead to rewarding careers.

- National Career Pathways Network
3. Career Pathways

1. Career Pathways Initiative
2. Promise of Career Pathways System Change
Advancing Along Your Career Path

Lifelong Learning → Job Advancement

Basic Skills, English Language Learning, Career Readiness

Bridge Courses

Skills Certificate & “Work and Learn”*

Associate or Apprenticeship Degree

Baccalaureate Degree

Unskilled Jobs

Semi-Skilled Jobs

Entry - Level Skilled Jobs

Entry - Level Technician or Apprentice

Skilled Technician or Journeymen

Managers and Technical Professionals

* “Work and Learn” includes programs such as: On-the-Job Training (OJT), internships, and Cooperative Work Experience (CWE).

Shows career accessible after completion of educational step.

Shows the climb to necessary education, in order to advance along career path.

U.S. Department of Labor
Employment & Training Administration

Career Pathway Resources

Six Key Elements of Career Pathway Systems

From: OSDOL - R5 ETA ASTD Technical Assistance Forum
Career pathway systems provide a clear sequence of education coursework or training credentials and have the following elements:

1. Build cross-agency partnerships & clarify roles
2. Identify industry sector or industry & engage employers
3. Design education & training programs
4. Identify funding needs & sources
5. Align policies & programs
6. Measure system change & performance

Six Key Elements of Career Pathway Systems

From: OSDOL - R5 ETA ASTD Technical Assistance Forum
October 17-19, 2011
# 1: Build Cross-Agency Partnerships and Clarify Roles

- Key cross-agency partners at the local and state levels are engaged to participate in the initiative.
  - Local team is formed to design, pilot, launch, and grow a local or regional career pathway system.
  - Partners are invited to design, craft, and implement a shared vision.
  - State team supports the local team with administrative policies and legislation to aid in local implementation and statewide growth. Senior state and regional leaders visibly support the initiative.

Roles and responsibilities are clearly defined and formalized.

- Create a leadership or steering committee to guide the development process.
- Clarify and formalize roles and responsibilities of the following:
  - Workforce system
  - Economic development system
  - Education system
  - Human service system
  - CBO’s
  - Employers
#2: Identify Industry Sector and Engage Employers

- Sectors and industries are selected and employers are engaged in the development of career pathways.
  - Determine labor market trends, skill development needs and opportunities, and employer preferences.
  - Select employers or industry representatives and plan how to pitch the initiative to them.
  - Plan how to work with employers in the different phases of the initiative (design, launch, operation, evaluation).

#3: Design Education and Training Programs

- Career pathway programs provide a clear sequence of education courses and credentials that meet the skill needs of high-demand industries.
  - Provide a clear sequence of education courses and credentials that lead to postsecondary education/training and employment.
  - Design programs to accommodate individuals regardless of their skill level at the point of entry.
  - Design programs around high demand industries and career ladders that pay family-sustaining wages.
  - Support programs through state legislation and administrative policies for sustainability.
Key questions to ask: How will we...

- Incorporate & align secondary & post-secondary education elements?
- Integrate & contextualize adult basic education & occupational skills training?
- Chunk curricula into shorter programs of study?
- Meet the need for flexible training & education options?
- Include academic & CTE content in a coordinated, non-duplicative progression?
- Integrate wrap-around services?
- Ensure the program leads to an associate or baccalaureate degree or industry-recognized credentials or certificates at the postsecondary level?

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Necessary resources are raised and/or leveraged to develop and implement career pathway programs.

- Identify resources needed to operate programs and core system components.
  - Program development
  - Professional development
  - Operating costs
  - Supportive services
- Ensure state and local partners work together to raise and leverage funding from federal, state, local, and foundation sources.
#4: Identify Funding Needs and Sources (cont.)

**Key questions to ask:**
- What are your funding needs?
  - Curriculum development
  - Professional development
  - Operating costs
  - Supportive services
- What funding sources should you explore?
  - WIA Titles I, II, & IV funds
  - Wagner-Peyser Act funds
  - Carl Perkins Act funds
  - TANF funds
  - State funds
  - Private foundations

From: OSDOL - R5 ETA ASTD Technical Assistance Forum
October 17-19, 2011

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#5: Align Policies and Programs

- Federal, state, and local legislation or administrative policies promote career pathway development and implementation.
  - Local and state partners identify key policy and program changes and actions needed.
  - Partners actively coordinate efforts across the region and/or state and establish formal procedures to institutionalize system change.
  - Agencies and programs collaborate to provide professional development across organizations and systems.

From: OSDOL - R5 ETA ASTD Technical Assistance Forum
October 17-19, 2011
#5: Align Policies and Programs (cont.)

- **Key questions to ask:**
  - How are career technical & academic programs linked (or not) at the community college? How can linkages be strengthened?
  - How does the eligible training provider list (ETPL) promote career pathway development?
  - How can One Stop and TANF service providers coordinate with each other in providing services?
  - What can be used to fund curriculum & professional development?
  - How can policymakers support the development of portable and stackable credentials?

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#6: Measure System Change and Evaluate Performance

- Track effect of policy changes and program designs on participant outcomes
- Arrange data-sharing agreements with key partners and employers, as appropriate
- Design systems for sharing performance information to support continuous learning and improvement

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From: OSDOL - R5 ETA ASTD Technical Assistance Forum
October 17-19, 2011
DISCUSSION?
QUESTIONS FOR ANDY?

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