SECTION 3: DESIGNING THE COURSE AND

CURRICULUM

EVEN THE BEST LAB IS NOT THE WORKPLACE.

- Marty Higdon, OCTC faculty

The closer we can align technical training programs with the real needs of industry, the better we can provide students and employers with what they need to be competitive and successful. Career and technical education programs generally are designed with these goals in mind, and seek to prepare students with the skills and experience necessary to perform in the workplace. Well-designed and aligned programs emphasize the relevance and connection of classroom training to the world of work, and many programs integrate work-based learning opportunities like co-ops or internships to strengthen this connection. Work-based courses, however, take this concept further, blending work experience with classroom learning so that work itself serves as a formal learning environment.

JOBS FOR THE FUTURE

Designing curricula for this model requires a significant overhaul of the content, delivery, and scope of existing course offerings, and requires a college to work collaboratively with industry partners and program developers to create learning activities that reach beyond the existing confines of the classroom and into the workplace. Essentially, a work-based course model asks a college to rethink curricula and expand on the concept of preparation *for* the workplace to incorporate learning *in* the workplace.

Section Three provides tools aimed at selecting courses, mapping competencies and job tasks, designing instructional delivery, and assessing learning in multiple contexts. These tools are designed to prompt critical analysis of existing college practices, and to promote a process for aligning curricula with industry needs and promoting student learning and development.

FOSTERING COLLABORATION

To implement a work-based manufacturing course model, colleges must work collaboratively with the local manufacturers to determine the skills most in need. This work goes far beyond general consultation on curricular content, and should be approached as a partnership to co-design curricula. Conversations should start early in the process of program development and focus on connecting faculty with industry representatives who have a full grasp of the skills, training needs, and gaps the model will address. These conversations should establish shared goals and a vision for the model, as well as build rapport between college and industry as the work progresses.

Colleges should identify and establish curricular development teams that draw on faculty teaching expertise, employer supervisors or expert operators at local companies, and other institutional or industry training experts to ensure that the goals of each individual stakeholder are met. This collaboration and co-design are critical to ensure that learning in all contexts is thoughtfully and creatively designed, rigorous, and structured with worker matriculation in mind.

DESIGNING COURSE CONTENT

Designing curricula for a work-based course begins with a detailed analysis of job tasks and responsibilities. This process of job-task analysis should be done with each employer or company to determine not only what areas are most in need of training, but also to establish trends among the industries in the region. As part of this process, employers, supervisors, industry training representatives, and others meet with college faculty and designers to map out course content. Job tasks are analyzed for frequency and importance, then mapped on to existing course structures. This process is a crucial first step, and it is important to balance the strict needs of particular companies with the scope of learning necessary to uphold the rigor of a credit-bearing course. In many instances, this process will require negotiation and revision of course materials, often in an iterative manner. In this way, the needs of industry, and specific companies, are met while adhering to academic principles and accreditation standards.

Most often, colleges will adapt existing courses for the work-based course model. Colleges should use existing syllabi and curricular outlines to determine what could be augmented to fit a work-based course approach. In some instances, a new course will need to be developed based on feedback from industry and employers. Either way, concept mapping of tasks to course content is similar and will require detailed conversations about what is necessary for foundational knowledge, skill mastery, and performance of job tasks.

DESIGNING INSTRUCTION FOR MULTIPLE SETTINGS

> I think that work-study piece is critical, because classroom training is one aspect, but when they are able to see that on a real asset or in a real manufacturing setting, I think it makes them understand what they've learned in a classroom and have the ability to actually apply that knowledge. So learning about it in a class is one aspect of it, but being able to apply that knowledge in on-the-job training is critical to them becoming a proficient operator.
>
> - Tim Sheldon, Organizational Effectiveness Specialist, Kimberly-Clark

The most significant and motivating aspect of the work-based course model is the varied approach to instructional delivery. The work-based course model is built on the idea that work is instructive, and deploying the workplace as a learning lab leads to stronger knowledge and refined skills. In doing this, work-based courses blend classroom fundamentals, safe and structured practice, and real-world applicability in one course.

Mapping curricula to job tasks lays the foundation for the process of designing instruction for the classroom and the job, and colleges will need to evaluate how best to deliver instruction in multiple settings. Colleges should examine how competencies can be taught based on a number of variables, including available tools and materials and risk and compliance measures, and determine what content is served by which delivery site.

The critical underpinning of work-based courses is the idea that for learning in general, and for technical education in particular, practice and application of knowledge should include real-world context. Many course competencies are taught best in a classroom setting, including theory or background knowledge, but others require hands-on practice and experience. In mapping out where and when instruction can take place, colleges should think broadly about tying in experiential learning practices and the need for real-world scenarios, as well as honoring a student's need for practice and development prior to assuming some responsibilities in the workplace. In turn, hands-on learning reinforces the student's commitment to developing learning and skills.

The instructional delivery planning worksheet in this section allows colleges and companies to explore together what makes the most sense in terms of deep learning. In using this worksheet, colleges should map out all possible instructional scenarios, and then determine which has the most impact balanced by feasibility for the workplace. For many activities, there will be more than one way to deliver instruction, and it may be a matter of determining what is taught in one place and reinforced in another. Additionally, some content areas that are more workplace-specific may require that a college faculty member work with an individual employer supervisor in designing specific activities outside a general class.

HARNESSING THE POWER OF THE EXPERT OPERATOR

Work-based courses broaden the instructor role to include both faculty and employers. For both the classroom and the worksite, it is important to determine who is best suited to instruct students. Ultimately, faculty should be chosen based on their experience teaching, their experience in industry, and their willingness to innovate. Employer supervisors or other expert mentors should be selected based on a combination of interest in developing trainees, their disposition and ability to mentor, and their expertise in the sector. Expert mentors are not necessarily the student's direct supervisor, but they supervise student job responsibilities and learning in the workplace during work-based courses. Both need to be willing to collaborate and build on each other's strengths. Often, supervisors are a first choice for this role, although it could be that an expert team member or company veteran may be a better fit. Employers need to think about the ways in which the employer supervisor will interact with the student while completing job tasks.

ASSESSING FOR MASTERY

> It actually also provides more of a model where it's mastery, where they have mastered the skills. Let me explain what I mean by that. In an average academic course, as long as I can pass with 60 or 70 percent of the knowledge, I get through the class. But that means there's 30 or 40 percent of the material that I really didn't master....In this work-based model, those students are mastering all those essential skills, and I think that helps us ensure that when we're transcribing the credits that an employer or end user of that student can feel very comfortable that they've mastered what everybody feels like are essential skills for them.
>
> - Scott Williams, President, OCTC

The theoretical foundation of the work-based course model is the idea that the workplace is itself a learning lab and platform for demonstrating, reinforcing, and assessing skills on the job. Assessment is key to making sure that these opportunities are documented and formalized, so that the learning that takes place in each context is acknowledged and supported.

Work-based courses are uniquely designed to promote deeper engagement with content, as the student is learning and applying knowledge and skills simultaneously, and assessment should reflect this. Simple instruments like written tests or quizzes, or "can-do" checklists, are helpful, but should not be used as the full measure of knowledge and ability. For work-based courses, experiential learning, or learning through doing and reflection, drives the assessment process. Program developers of work-based courses should integrate practices of both formative and summative assessments for learning. As much as possible, assessment should be linked to company job performance processes and benchmarks to help students understand how skills and knowledge are evaluated and rewarded on the job.

Designing assessment practices requires strong communication, agreement on mutual goals, and commitment from both college and industry.

Wherever possible, employers and college faculty should share assessment documents, collaborate on assignments or projects, and generally work to inform the practice of one another. Sound assessment design can enable both employers and the college to identify specific goals and communicate degrees of student progress. Employers can provide valuable information for faculty on how a student performs a particular skill on the job, and faculty can inform employers on when a student has demonstrated sufficient understanding of a new concept or skill and is ready to carry out a work task. This symbiosis is critical to gathering the full range of information on a student, and it forms the cornerstone of any successful work-based course program.

Additionally, work-based course assessments can promote mastery, rather than simple competence, on the job. For a student to successfully demonstrate mastery, he or she must be able to perform in both the classroom and the workplace. This establishes a strong foundation and shows the student's ability to use, transfer, and apply knowledge from one context to another—skills that employers continually cite as integral to work performance. Also, it provides a launchpad to help students and workers continue to advance once they are employed and as part of a career development plan.

This section provides several tools to guide work-based course design, starting with selecting which existing courses to adapt to this format. Once a course has been selected, the tools provide a process to design three critical elements of a work-based course at a detailed level: course competencies defined in relation to job tasks; the determination of work-based, classroom, blended, or online delivery for each course competency; and assessment instruments to evaluate whether the competencies have been mastered. The final tool helps colleges consider whether an employer has sufficient demand from its own cohort, or whether courses should be offered through employer consortiums on a broader industry basis, providing opportunities for portability and for customization by individual companies.

TOOL 3-1: DETERMINING WHAT COURSES TO ADAPT

Type of Tool: Action guide

Summary: The first step in your course design process is selecting which courses to adapt from their existing, traditional format to a work-based delivery. The decision will be based on a variety of factors unique to your college and region, but some basic activities and considerations can guide your selection process. This tool provides guidance on creating work-based courses that bring together the skills needs of employers with the educational strengths of community colleges. The tool also includes considerations of which types of courses may be best suited for this delivery format and how to consider adapting multiple courses simultaneously. While the activities in Tool 2-3 focus on who you should engage as an employer representative on a work-based course team, the activities in this section focus on designing course content.

Why: Early planning about which courses to adapt will pay off in several ways. First, work-based courses will be most effective if they maximize the degree to which they align with the needs and assets of both partners, and so these attributes should be the basis of the decision- making process. Second, adapting work-based courses without uptake by employers wastes significant resources, because adapting each course is a time-intensive process. Identifying multiple employers with interest in a particular work-based course will help ensure that the investment in course development pays off. Third, these conversations are a useful way to build the relationship between employers and the college that will be essential to ultimately delivering these courses. Finally, this process gives colleges deeper insight as to how work-based courses can work together and with traditional courses to lead to a manufacturing degree.

Who Should Use this Tool: Program administrators and members of the core work-based course team

Spotlight on OCTC: OCTC knew from the start that it wanted to adapt numerous work-based courses, not just one or two, and the model would be their new way of doing business with employer partners. Still, OCTC went through a deliberate process wit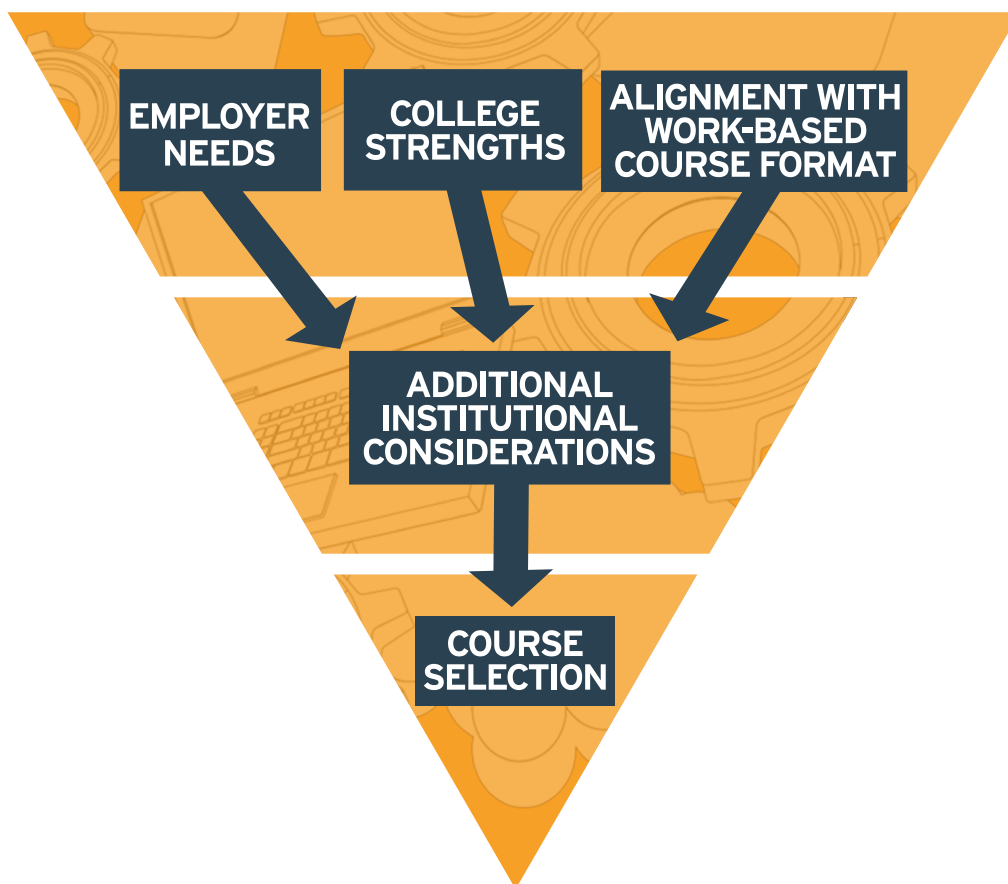h a wide range of manufacturers to select the first few courses to adapt. Through conversations with individual companies and an employer focus group, OCTC listened to employer needs and learned how they thought specific work-based courses could fit into their training. When employers came together, they echoed each other's needs for specific skills and occupations. Through this process, OCTC selected several courses most in demand. Employers found the courses developed as a result of these conversations to be responsive to the interests they identified, so the college was then able to use these popular work-based courses as a launchpad for building out a wider array of work-based courses.

With a stable of work-based courses, OCTC is now able to enter an even more detailed process to identify the courses most relevant to employers. They may offer existing work-based courses or develop new ones. Irvin Rothgerber, the maintenance trainer at Waupaca Foundry Plant Five, describes their workers

"doing a hydraulic schematic...and then putting the hydraulic system together. The [OCTC] instructors there are taking notes, and then will base our classes off...where their skill level is in that assessment...We'll try to organize or put together classes on that information.

ALIGNING PARTNER NEEDS

This tool provides ideas to bring together employer needs, college strengths, and key attributes of work-based courses in order to select the first course or courses to adapt to a work-based learning format.

EMPLOYER NEEDS

COLLEGE STRENGTHS

ALIGNMENT WITH WORK-BASED COURSE FORMAT

ADDITIONAL INSTITUTIONAL CONSIDERATIONS

COURSE SELECTION

Employer Input

Employers are a major driver of work-based courses: the students are their workers, the on-the-job learning happens in their workplace, and their supervisors provide the hands-on instruction. These courses cannot happen without fully engaged employers, and so the course selection process should gather their input from the beginning.

Strategies to Collect Input

- Survey companies you have provided training for in the past, that frequently hire your graduates, or with whom you have begun partnership discussions. This is a quick way to get a snapshot of the landscape. You may have to ask the questions in a quick phone call if that is the format most convenient for employers. This can be a way to further target the occupations or skills to prioritize in a work-based course.

- Convene a focus group of employers. While it can be difficult for employers to make time to attend an in-person event, talking with other employers can provide great value. This gives employers opportunities to identify their common needs and to give each other ideas about how work-based courses could complement their existing training activities. If you need help, enlist your economic development leaders to participate.

- Meet with one or two key partners with whom you are already working to determine how you can best serve their educational needs and to see whether work-based courses seem like a natural fit. If so, you can explore whether it would make sense to adapt specific classes to the work-based format regardless of interest from other employers.

Employer Considerations

Find out what types of educational opportunities employers are seeking:

- What are their primary skill needs, or positions that they have the most difficulty filling? Do their current skills gaps require short-term, medium-term, or long-term training?

- Are they only interested in highly targeted customized training or open to more comprehensive technical education?

- How will work-based courses fit in with their other training activities? Will it feed into existing, advanced training such as an apprenticeship? Will it fill an emerging skill need that has not yet been addressed?

- What are the educational levels of the employees who will receive the training? Are they college ready, have they completed college courses, or do their educational backgrounds vary?

- What are their career expectations for employees who receive training? Will they be promoted in conjunction with the training, or learning skills for their current occupation?

Landscape of Educational Needs

Analyze the input you have collected from employers to identify any common themes that could be addressed for groups of employers.

- Are employers looking to train workers for similar occupations or skill sets? If so, what are the top occupations that need training? How do these skill sets map onto the competencies taught in the college's manufacturing department?

- Are employers focused on front-line workers, middle-skilled positions, or more advanced training? Or could they benefit from educational opportunities across a career pathway?

- Are the companies open to a consortium training with other employers, or do they want the course delivered to them individually?

College Manufacturing Program

Work-based courses are distinct from other forms of employer-driven manufacturing education because they are drawn from credit-bearing courses that are requirements within a college's manufacturing degree and certificate programs. They are not intended to provide generic credit but rather to provide an alternative format for technical courses required for program completion that also advances student careers. Several guiding questions can help a college determine their interest in selecting a specific course or courses to be work-based courses. You may refer to the results of your self-assessment in Tool 1-4, and refine those answers to be course-specific:

- Does the faculty have greater capacity to offer certain courses, or is the faculty already at its limit in delivering specific courses?

- Are there courses that require capital investment that have prevented their growth in the traditional format? If so, could the equipment at the worksites of employers substitute for that equipment in the college labs?

- Are some courses foundational or relevant to multiple degrees or certificate programs? Would offering any of those courses provide a greater range of opportunities for students?

- Are any courses regularly oversubscribed, so that they could benefit from another mode of delivery to meet student demand?

ALIGNMENT WITH WORK-BASED DELIVERY

Not every course makes sense as a work-based course. Look at the courses within your manufacturing department and consider whether the content of each course lends itself to work-based delivery:

- Is the course content more theoretical or hands-on? Hands-on learning is generally a better match to work-based courses.

- Do the job tasks that align with course competencies vary widely across employers? Some variation maximizes the benefits of this delivery, allowing students to learn from a real environment they might not recognize in the classroom. However, if the workplaces look too different, it might be hard for a student to learn the underlying universal concept that they could take into a different workplace.

- How often are the skills required at work? Even if certain skills are critical for employees to learn, they might not be put to use on a regular basis, making it harder to teach them in the timeframe of a course.

BRINGING IT ALL TOGETHER

You have now identified potential work-based courses from the perspective of the employer, the college, and the instructional delivery. Where do these potential courses overlap? You might have one course identified in all three ways, or you might have a dozen. Select a subset of courses from this list based on any additional considerations that are relevant to you, such as:

- How many courses can you afford to redesign for this delivery?

- Do you have priority employer partners with specific work-based course preferences?

- Would you like to select courses that stack to a specific degree or certificate, or would you like to offer work-based courses relevant to a wider range of your manufacturing programs?

TOOL 3-2: MAPPING TASKS TO COMPETENCIES

Type of Tool: Worksheets

Summary: This tool is designed to assist in the translation of job tasks to course competencies. It outlines a process for supervisors and other employer experts to document the competencies required for a job, and to compare them to the competencies outlined in the course. The process has much in common with popular job task analysis processes such as the DACUM or SCID, but is not as time or resource intensive. Instead, it focuses on the information needed to redesign the delivery format of the college course.

Why: Work-based courses need to translate real-life job tasks into course content, and these tools provide a format for the process. In using these tools, employers are able to see how their job activities can translate to components of instruction, and colleges can come to understand what is most in demand in the real world. This mapping is essential to ensuring that work-based courses are grounded in the context of the manufacturing sector and local companies while also adhering to the rigors of college-level course design.

Who Should Use this Tool: Teams consisting of career and technical education faculty and employer representatives, ideally those who will be acting as supervisors or mentors.

Spotlight on OCTC: At OCTC, faculty and employers worked closely together to identify job tasks and map them onto academic competencies. The collaboration was essential to creating an effective work-based course.

"We worked together developing that program and developing the task lists and the on-site . . . went through the plant—the on-site tour. That's what it was, on-site tour. And two heads are always better than one, right? So he had input. I had input. The company had input. And we feel like we came up with a really good product there.

–Marty Higdon, OCTC faculty

TASK TO OBJECTIVES MAPPING

Converting Traditional Course Content to a Work-Based Course Format

Task and competency mapping is essential to designing a work-based course, as it gives both faculty and employer partners the opportunity to determine what skills and information are critical in a work/learning setting. In developing a work-based course, we recommend using an abbreviated, "lighter-touch" task or job analysis process in order to focus on revising existing course content.

> **Job Task Analysis:** Many programs conduct fuller task or job analyses in full-scale program development or program evaluation efforts through methods including DACUM (Developing a Curriculum) or SCID (Systematic Curriculum and Instructional Development). In these instances, the job or task analyses are more highly structured, lengthy, and detailed than what is required for adapting work-based courses. DACUM International Training Center at Ohio State University's Center on Education and Training for Employment and the US Office of Personnel Management provide additional information about job task analyses.

Questions to Address in the Light Touch Task Analysis

Are you designing a new course to be delivered in a work-based learning model?

If yes, start with the Job (backward mapping)

- **Inventory:** What tasks exist in the job? Identify these through subject matter expert interviews, supervisor interviews, job descriptions, or a full-scale task analysis.

- **Selection:** What tasks are necessary or relevant for job performance? Which are essential?

- **Analysis:** What are the tasks comprised of? What knowledge is needed for completion? What supporting tasks or skills are needed?

- **Sequence:** In what sequence are the tasks laid out? In what order do you perform them?

- **Alignment:** How do you align tasks with performance? How are tasks transformed into performance objectives?

Are you adapting an existing course to be delivered in a work-based learning model?

If yes, start with the Course (forward mapping for work-based courses)

- **Inventory:** What competencies (or learning objectives) in the course are supported on the job? Faculty interview subject matter experts or supervisors on the job to identify the knowledge necessary to complete job tasks, and what skills and competencies can be taught and reinforced there.

- **Selection:** What competencies are the most needed, or most frequently used? What is emphasized or deemphasized on the job? Designate those that are not commonly used by employer partners to be taught in the classroom or by way of online or self-paced instruction.

- **Analysis:** What subskills are necessary for the main learning objectives to be mastered? What undergirds the tasks and skills necessary for job performance tasks? Ask employer partners to identify those skills that are the most in need and in most demand on a daily basis.

- **Sequence:** Determine preliminary sequence in which things should be taught, practiced, or mastered, both on the job and in the classroom.

Process for Conducting the Light Touch Task Analysis

- Outline existing learning objectives and goals from course, designated as tasks.

- Through interviews, surveys, or focus groups, ask employers and subject matter experts to select and rate by importance, frequency, and difficulty the learning objectives (job tasks) necessary for mastery on the job.

- Faculty and employer partners work together to group tasks into related modules according to importance, frequency, and degree of difficulty.

- Sequence modules and reformat course depending on feedback.

"LIGHT" JOB TASK ANALYSIS WORKSHEET (INVENTORY AND SELECTION)

Course Module: _____

Importance Scale	Frequency Scale
How important is this task to the job?	How often is the task performed?
0 = Not Performed	0 = Not Performed
1 = Not Important	1 = Every few months to yearly
2 = Somewhat Important	2 = Every few weeks to monthly
3 = Important	3 = Every few days to weekly
4 = Very Important	4 = Every few hours to daily
5 = Extremely Important	5 = Hourly to many times each hour

Task	Importance	Frequency
What tasks found on the job could be taught in the course?	How important or critical are they?	How frequently do they occur on the job?
EXAMPLE: Maintaining pneumatic transmitters	*4*	*3*

COMPETENCIES AND SUB-SKILLS WORKSHEET
(ANALYSIS OF COURSE COMPETENCIES)

For each task, ranked from most important to least, outline the competencies and subskills needed to perform at a mastery level. Take time to think about the nature of the competencies needed for each task; define them in terms of knowledge, skill, or ability. This categorization can later assist in the designation of instructional settings from workplace, to classroom, to online/self-study.

Knowledge	An organized body of information, usually factual or procedural in nature.
Skill	The proficient manual, verbal, or mental manipulation of data or things.
Ability	The power or capacity to perform an activity or task.

Task	Competency	Competency	Competency
What tasks on the job could be taught in the course?	What underlying knowledge, skill, or ability must a worker possess to complete the tasks?		
EXAMPLE: Maintain pneumatic transmitters	*Identify and explain pneumatic transmitters* *(knowledge)*	*Inspect pneumatic transmitters* *(skill)*	*Troubleshoot pneumatic transmitters* *(ability)*

Now, group together tasks in modules or units. These may remain in a similar grouping as in your existing course, or there may be some revision based on employer partner feedback.

MODULE GOALS	GOAL	
PERFORMANCE OBJECTIVES	TASK	TASK
ACTIVITIES	COMPETENCIES	COMPETENCIES	COMPETENCIES
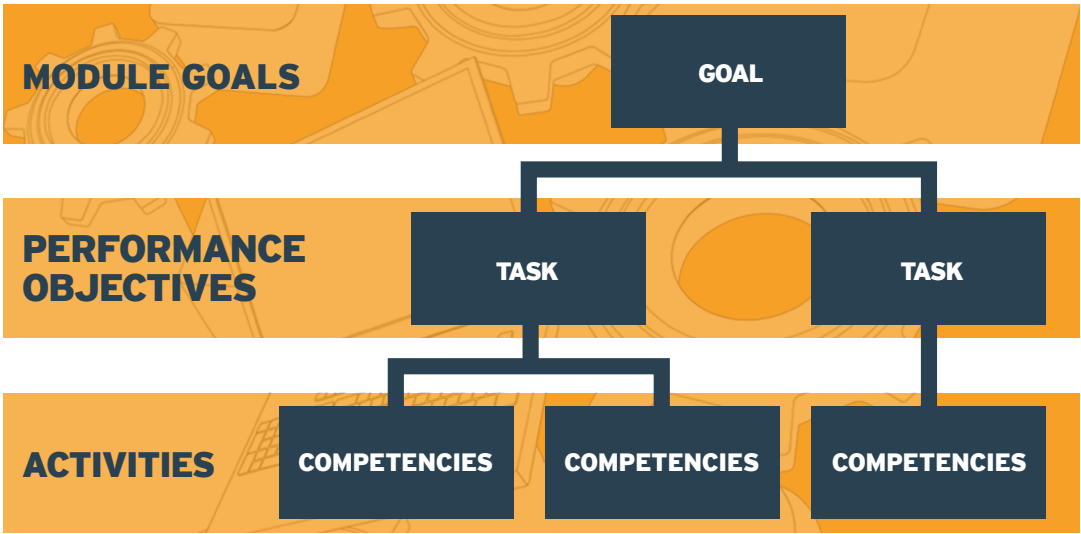
Content Grouping (Module Goal)	Tasks/Objectives	Competencies
1.	Tasks x-xx	1. 2. 3.
2.		1. 2. 3.
3.		1. 2. 3.
4.		1. 2. 3.

RESOURCES AND REFERENCES

1. Annett, J., & Duncan, K. D. (1967). Task analysis and training design.

2. Dick, W., Carey, L., & Carey, J. O. (2005). The systematic design of instruction.

3. Jonassen, D. H., Tessmer, M., & Hannum, W. H. (1998). Task analysis methods for instructional design. Routledge.

4. Terlouw, C. (2014). Instructional design for higher education. Instructional Design: International Perspectives II: Volume I: Theory, Research, and Models: Volume II: Solving Instructional Design Problems, 341.

Sites and Resources of Interest

- Modified Job Task Analysis (MJTA). US Department of Labor, Mine Safety and Health Administration – MSHA:

  http://www.msha.gov/interactivetraining/tasktraining/home_intro.html

- Developing Skilled Workers: How-to Guide for Educators, Job Analysis Sample Power Point. Manufacturing Institute, Tools and Resources for Educators

  http://www.themanufacturinginstitute.org/Skills-Certification/Educator-Resources/Tools-and-Resources.aspx?p=2

TOOL 3-3 INSTRUCTIONAL DELIVERY FRAMEWORK

Type of Tool: Worksheet, planning matrix

Summary: This tool is designed to facilitate development of an instructional plan that determines what skills will be taught and where, what activities will be carried out, and what assessments may be needed.

Why: Work-based courses are in essence a varied delivery model, and this tool provides the framework for developing all course content and instructional methods. This step is crucial to developing a true work-based course.

Who Should Use this Tool: Faculty members, employer supervisors and mentors, deans

Spotlight on OCTC: According to Dean Autry, Associate Dean at OCTC, this step of the design process is essential to ensuring the academic rigor of work-based courses:

> The biggest part of figuring out what you can teach by the faculty and by the workplace is you have to meet with the supervisor, and you have to look and see what they have in their plant, what they're doing...We look and see what things they can do on-site and what we also feel comfortable in getting checked off on site. We want to make sure that, first of all, if the supervisor checks off on a task or the faculty checks off on a task, we make sure that it is something they can do by themselves. It's very important as an educational institution your quality does not change. Your quality stays the same. Your expectations for your students stay the same.
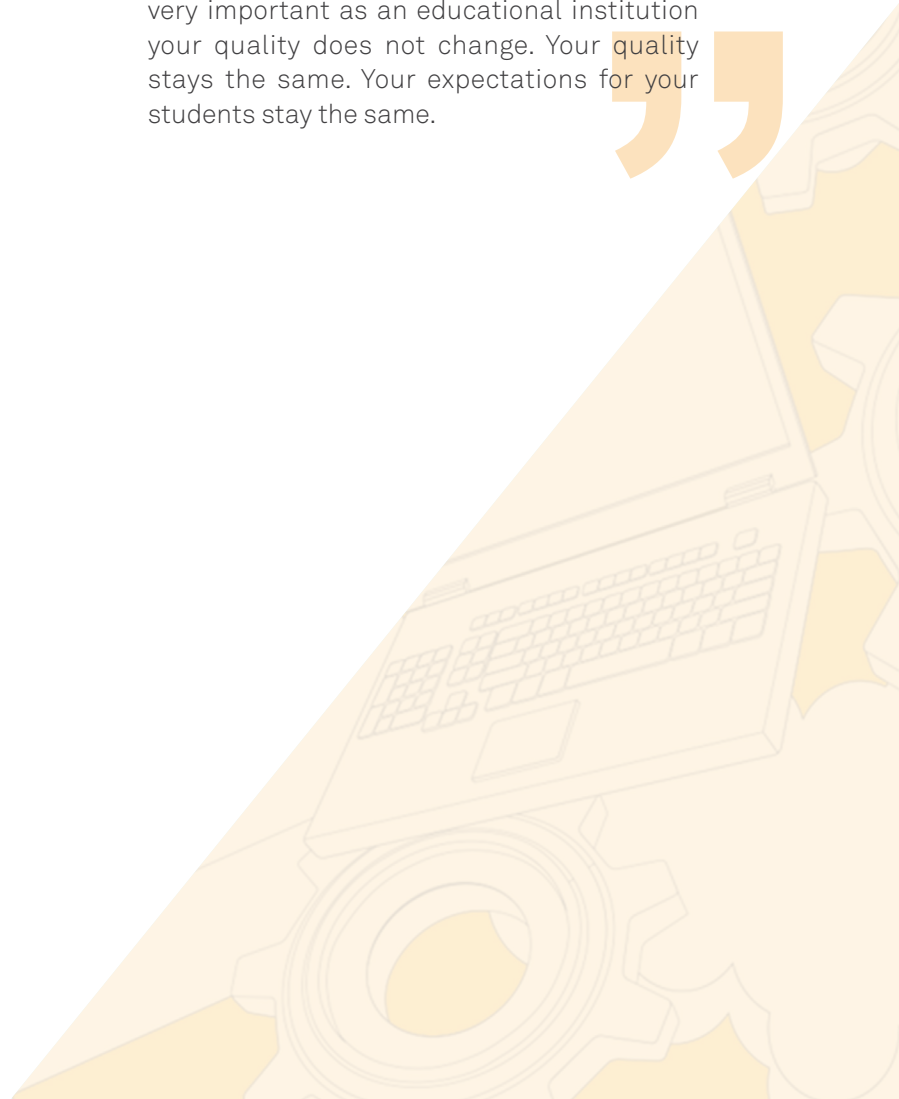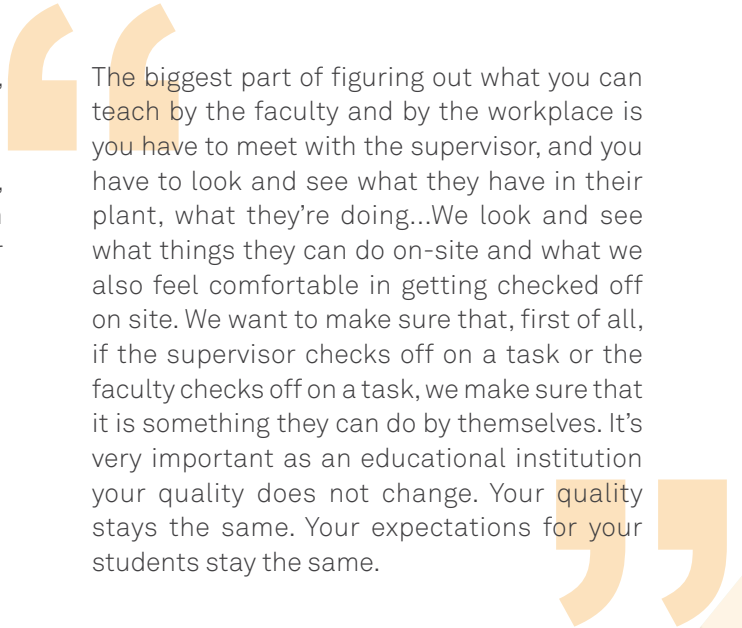
GENERAL FRAMING QUESTIONS

1. What is the capacity of both learning sites (college and workplace) to deliver this instruction?

   - What are the staffing and scheduling considerations (number of instructors, "relief" or adjunct faculty or supervisors, flexibility of course schedules, availability of space, etc.)?

2. How will shift considerations and production schedules be taken into account for worksite delivery? Are there natural segments embedded in the workflow that can be adapted for instruction (mini-semesters, trimesters, co-op scheduling)?

3. What physical conditions exist for each delivery option?

   - Where will the classroom instruction take place? Is there currently a separation between lecture and lab?

   - Where will the worksite instruction take place? Is the instruction separate or integrated with the larger work environment?

   - If you are interested in an online learning component, what distance-learning technology (software, basic skills development, etc.) is available at both college and worksite locations? What support infrastructure is available (technical assistance, IT, tutors/coaches, etc.)?

4. What are the material considerations for this course content? Are there variables in machines or tools from classroom to worksite? How do these differences factor into instruction?

5. What are employers specifically seeking from this mixed delivery system? Have they identified specific goals for worksite instruction (efficiency, safety, accuracy, work quality, etc.)?

INSTRUCTIONAL DELIVERY QUESTIONS

These questions are intended primarily for existing courses being adapted to a work-based delivery, rather than for the development of entirely new work-based courses. However, for new courses, you can examine similar manufacturing courses to gain insight into your options for work-based, lab, classroom, and online learning.

1. What course content is currently delivered in college labs? Is the equipment similar to area employer tools and resources?

2. What course content, if any, is delivered via online learning management system or distance learning? How are these aspects integrated with classroom work and labs?

3. At first glance, what lessons, modules, or units of instruction lend themselves most easily to work-based learning?

4. Are there computers available at the worksite? Are they accessible to workers?

INSTRUCTIONAL DELIVERY MATRIX

This chart outlines basic considerations for delivery methods, student engagement, and resource use. The list is meant to guide work-based course teams as they design their content for delivery in multiple sites, focusing on the workplace.

Method	Time/Schedule Considerations	Common Availability of Resources	Student Engagement Level
Work-Based Demonstration	• Production time constraints • Efficient use of supervisor time	• Readily available as required in regular business operations • Ample opportunity through observation of regular business practices • Limited safety concerns • Strong correlation to learning objectives/work environment	Medium
Work-Based Practice	• Requires time for trial and error • Production time constraints	• Readily available as required in regular business operations • Moderate to high concerns about resource use and cost efficiency • Moderate safety concerns • Strong correlation to learning objectives/work environment	High
Classroom: Instructor Demonstration	• Low level production constraints • Efficient use of classroom instructor role • Classroom lab capacity constraints	• Readily available at the community college • Ample opportunity, equivalent to traditional courses • Limited safety concerns • Moderate correlation to learning objectives/work environment	Medium
Classroom: Lecture	• Low level of production constraints • Efficient use of instructor role	• Readily available at the community college • Ample opportunity, equivalent to traditional courses • No safety concerns • Low correlation to learning objectives/work environment	Low

Table continues on next page.

Method	Time/Schedule Considerations	Common Availability of Resources	Student Engagement Level
Online: Self-Paced	• Limited time constraints • Efficient use of worker	• Potential limited availability of personal computers and internet access • Potential limited availability of learning resources appropriate for online learning • Low correlation to work environment	High
Online: Facilitated Synchronous	• Moderate time constraints/considerations • Moderate use of worker time	• Potential limited availability of personal computers and internet access • Low correlation to work environment	Medium

INSTRUCTIONAL DELIVERY PLANNING WORKSHEET

This worksheet allows course designers to weigh the delivery options for each competency within a work-based course. By considering what would be required and gained by teaching each competency in a worksite, classroom, or online format, faculty and other course designers can map out the delivery modes across the course in a coordinated way that maximizes work-based learning while remaining feasible. For each competency identified in Tool 3-2 or other performance objectives within the course, complete the worksheet to determine how it would be taught in each delivery environment—what would teaching activities look like, what materials would be required, and how would learning be assessed? The final column provides an opportunity to weigh the benefits and challenges of using each delivery mode to teach a specific competency.

Course Content Task or performance objective	Delivery Environment How could this be delivered?	Current College Delivery How does the college deliver this now (worksite, classroom, or online)?	Instructional Method Lecture? Lab Demo? Practice?	Instructor Type and Availability	Activities What will students do?	Equipment or Materials What will students use?	Assessment Activities How will learning be measured or captured?	Summary of Benefit for Environment What are the pros and cons of this delivery environment?
1. Task/ Performance Objective: **(What should students be able to do? What is the task?)** _____ _____	Worksite			Supervisor				
	Classroom			College Instructor				
	Online			Tutor or Coach? Self-directed?				
Delivery mode chosen and summary of why:								

| Course Content

Task or performance objective | Delivery Environment

How could this be delivered? | Current College Delivery

How does the college deliver this now (worksite, classroom, or online)? | Instructional Method

Lecture? Lab Demo? Practice? | Instructor Type and Availability | Activities

What will students do? | Equipment or Materials

What will students use? | Assessment Activities

How will learning be measured or captured? | Summary of Benefit for Environment

What are the pros and cons of this delivery environment? |
|---|---|---|---|---|---|---|---|---|
| **2. Task/ Performance Objective:**

(What should students be able to do?)

_____

_____ | Worksite | | | Supervisor | | | | |
	Classroom			College Instructor				
	Online			Tutor? Self-directed?				
Delivery mode chosen and summary of why:								

Table continues on next page.

Course Content	Delivery Environment	Current College Delivery	Instructional Method	Instructor Type and Availability	Activities	Equipment or Materials	Assessment Activities	Summary of Benefit for Environment
Task or performance objective	How could this be delivered?	How does the college deliver this now (worksite, classroom, or online)?	Lecture? Lab Demo? Practice?		What will students do?	What will students use?	How will learning be measured or captured?	What are the pros and cons of this delivery environment?
3. Task/ Performance Objective: **(What should students be able to do?)** _____ _____	Worksite			Supervisor				
	Classroom			College Instructor				
	Online			Tutor? Self-directed?				

Delivery mode chosen and summary of why:

TOOL 3-4 ASSESSING WORK-BASED LEARNING

Type of Tool: Templates, guiding questions, and recommendations

Summary: This tool details how to plan, develop, and implement assessment for work-based learning. Tools in this section are designed to assist colleges and employers in organizing and documenting learning in both the classroom and the worksite.

Why: Assessment of learning in multiple contexts is crucial to the work-based course model. The transferability of learning objectives from work to classroom is reinforced by a robust assessment strategy that allows multiple partners to document student skill gains. These tools are designed to foster greater collaboration and communication between faculty and employer supervisors or mentors so that assessment is informed by both parties and reflects learning at both sites.

Who Should Use this Tool: Faculty members and employer supervisors or mentors

Spotlight on OCTC: At OCTC, assessment was conducted in a number of ways, with employer supervisors or mentors conveying information about what a student needed to learn or perfect, and faculty members communicating when a student had demonstrated proficiency in the classroom.

TYPES OF ASSESSMENT

For work-based courses, a portfolio approach to assessment can allow for multiple partners to weigh in on student progress and performance. As instruction is spread across multiple sites, each partner is asked to contribute assessment instruments that demonstrate student progress and mastery of content. Portfolios should have a mix of formative (assessments for learning and development) and summative (assessments of learning and mastery). Examples can include:

Formative

- Textbook assignments

- Written material

- Project rubrics

- Class or work notes

- Self-reviews

- Employee performance review records and attendance

Summative

- Standardized tests (entrance exams, credentialing, and benchmarking instruments)

- Completed work task lists and production goal tracking

Portfolio Content

College Faculty Contributions

- Entry exams, standardized tests

- Textbook assignments, worksheets, completed materials

- Online materials and assessments

- Worksite observation notes

Employer Supervisors' Contributions

- Documentation (work logs, task lists)

- Employer work records (attendance, performance)

- Rubrics and work samples

Each instructional site should contribute material, and close communication (scheduled check-ins and written documentation) is essential to ensure alignment with both learning and production/work goals. If possible, college faculty should visit the workplace to observe student worker performance at regularly scheduled intervals (up to two times for a single work-based course) to document how learning is applied and to check for successful learning transfer. A "master" task list should be shared between college faculty and employer partners to ensure students are demonstrating skills and abilities at both instructional sites, and regular contact and course notes can ensure that mastery is being developed.

ASSESSMENT TEMPLATE

Week (Date)	College Faculty Notes	Employer Supervisor Notes

ON THE JOB PERFORMANCE RUBRIC (SAMPLE)

Objective or Task	Definition of Mastery	Emerging	Developing	Proficient	Exemplary
	Determined jointly by college and employer	Evidence of partial ability and progress	Evidence of developing ability and progress	Evidence of adequate ability	Strong evidence of mastery

MASTER TASK COMPLETION LIST

Student_____

Course_____

Module_____

Task	Competencies	Notes	College Faculty (date)	Employer Supervisor (date)
	1. 2. 3.			
	1. 2. 3.			
	1. 2. 3.			
	1. 2. 3.			
	1. 2. 3.			
	1. 2. 3.			
	1. 2. 3.			

TOOL 3-5: ASSEMBLING YOUR COHORT MODEL

Type of Tool: Action Guide

Summary: There are a number of considerations when designing instruction for a work-based learning program; chief among them are multisite delivery (work and classroom based) and cohort compilation. This tool offers guiding considerations as a college assembles each cohort for a specific work-based course. First, it poses questions to determine whether a single or mixed employer cohort is more realistic for the college and employer partners. Second, it frames key issues that emerge for each form of cohort composition across a range of work-based course delivery elements: number of students in the cohort; scheduling; instructor and supervisor roles; and course content, materials, and site considerations.

Why: Depending on the number of employers engaged, the scheduling and production cycles of varying sites, and the general skill needs of an industry, the cohort model compilation can greatly influence program design. Program designers should think through the implications of specific cohort models before beginning a work-based course so that instructors are not stretched too thin or attempting to balance too many differing expectations across employers. The considerations raised in this tool relate to basic issues that will need to be considered for a successful work-based course cohort, even after the competencies and overall design of a work-based course have been determined.

Who Should Use this Tool: Program administrators, work-based course faculty

Spotlight on OCTC: When OCTC began to develop its work-based course program, the program administrators expected that major employers would each enroll a cohort of students roughly equivalent to the size of a traditional manufacturing class. Instead, they found that companies could not fill a cohort of that scale without impacting their production line too greatly. Instead, OCTC has worked with employers to build three types of cohorts, each made possible in different ways.

First, OCTC offered employers single employer work-based courses but with reduced size cohorts. A state training fund to support community college training for companies, KCTCS-TRAINS, pays for the additional faculty cost for this design. They have found that companies appreciate the degree to which the delivery of these courses can be customized to their needs, maximizing the flexibility available within an existing academic course.

The second type of cohort offered by OCTC is a small consortium approach in which two or three employers join together to train their incumbent workers. As with the single employer cohorts, the class size is smaller than in a traditional class, with KCTCS-TRAINS supporting the additional instructor costs. With only a few employers involved, it is easier for instructors to coordinate and continue to meet the particular needs of each company. Work-based course students have expressed the benefits of learning from each other how the knowledge they gain in the courses looks on the job in different environments.

Most recently, OCTC has brought together over a dozen manufacturers to provide consortium work-based course cohorts that are the same size as traditional manufacturing courses. Through GO FAME (Greater Owensboro Federation for Advanced Manufacturing Education), part of a statewide manufacturing program to pair classroom instruction with on-the-job training, employers hire workers who also participate in a suite of work-based courses that stack into an associate's degree. In Owensboro, each company has typically hired one or two workers to participate and employers jointly identified common gaps in their talent pipeline to guide the program design. Because work-based course students are new to the companies rather than incumbent workers with varying degrees of experience and skills, the educational needs have been compatible across companies. OCTC has used courses they had already adapted to a work-based delivery format as the core of their GO FAME program.

ONE EMPLOYER OR MORE?

Many aspects of work-based course design will depend on the employers engaged. The first step in answering this question for a specific cohort is to determine if a single employer has sufficient capacity for its own cohort, or if multiple employers need to come together to provide a sufficient number of students. Several questions can help determine which of these options will work best for the employers and college:

How flexible is the college?

- What is the minimum number of students required per class at your college?

- Do your work-based courses need to enroll as many students per course as a traditional class, or do you have alternative forms of resources to supplement instructor time and other course costs?

- Does the college have resources for instructors to spend extra time within a course coordinating among multiple employers?

- What is the level of commitment the college will require from each employer to engage in a work-based course program?

Is a single employer cohort possible?

- For smaller employers, how many students will be available at a given time?

- For larger employers, how many students will be available with similar needs or at entry points of employment?

- Are there ample workers to fill production gaps when workers are learning?

- Does the company's training budget or policies limit the number of workers who can enroll in work-based courses at the same time?

Is a mixed employer cohort possible?

- Would the employers who are interested in providing work-based courses be open to collaboration with other employers?

- How many workers can be served through a work-based course through a compilation of employers from local industry?

- Are there similarities across employers about what technical skills workers currently possess, and what they are lacking?

- What are the selection criteria that employers plan to use for workers to enroll in work-based courses? Are employers interested in enrolling newer, entry-level workers, or more seasoned, proven veterans? Is this likely to lead to a cohort of work-based course students with similar educational needs?

CONSIDERATIONS FOR COHORT COMPOSITION

Once you have determined whether a single employer cohort or mixed employer cohort works best for your employer partners, the cohort type will inform the design of the work-based course itself. In addition, the considerations in this matrix can guide an evaluation of the feasibility of the course itself.

If there is a single employer engaged, the questions surrounding cohort compilation are typically centered on scheduling and capacity constraints (for both work-based course students and supervisors), identifying specific skills gaps and work quality concerns, and clarifying career advancement opportunities. When engaging several industry employers, questions of scheduling become more involved, as do compatibility of the skills training needs, supervisor training, and career advancement opportunity structures. For example, for a mixed employer cohort, how does the variation in technology available across companies impact the ability to teach the same competencies in a work-based format rather than in a lab or classroom?

Cohort type	Number of Students	Scheduling	Instructor and Supervisor Roles	Course Content, Materials, and Site Accommodations
Single Employer	Does the number of students available through this employer meet the minimum requirements for the college?	• How can the course accommodate shift variations within a site? Can you schedule for workers who work second or third shift, or create ways to relieve pressure on a single shift? • Has the company identified time for demo/practice?	• How many suitable mentors are available? • What kinds of incentives can the company provide for its supervisors?	• Is there consistency of equipment from work to classroom? • Does the company have the necessary technology, materials, and tools available for efficient use within the course?
Mixed Employer	How will the cohort balance the presence of workers from multiple companies? Is there a cap on workers from each site?	• How can the course accommodate shift variations and production schedules at varying sites? • Will supervisors and mentors be similarly available across sites? • How will multiple companies provide compatible time away from work activities?	• What is the college's strategy for training and orienting staff from multiple sites? • How will the instructor work with varying levels of employer accommodations? • How will the different kinds of incentives for supervisors impact learning across the cohort?	• How does varying company equipment impact what can be taught on the job for each company? • Do companies have varying levels of on-the-job learning resources accessible to their workers? • What are the varying employer goals for program participation? • Can a single cohort meet cross-employer skill needs?

WORK-BASED COURSES: BRINGING COLLEGE TO THE PRODUCTION LINE

This document is part of a toolkit that provides guidance to community college administrators and faculty who are interested in bringing a work-based course model to their college. Tools and resources walk through the major stages of program design and implementation. To access the complete toolkit, go to: http://www.jff.org/workbasedcourses

JOBS FOR THE FUTURE