



Engineering Drafting

Youth Apprenticeship

ENGINEERING DRAFTING

Engineering Drafting youth apprentices prepare engineering drawings using current industry software, integrating concepts of building materials, engineering practices, and mathematics. Apprentices must adhere to industry safety and security standards.

Length of Apprenticeship: One year. This pathway is the prerequisite to second year engineering programs.

COMPETENCIES

Youth apprentices must complete a **total of 13** competencies. **Eleven** must be from the list below. If necessary, employers can substitute **2** competencies with another occupationally appropriate skill. That skill should be added to the competency list for assessment.

Competencies
1. Interpret technical drawings 2. Use measuring devices 3. Organize databases, files, and drawings 4. Reproduce documents and plans 5. Use engineering drafting software 6. Develop 2D (orthographic) view drawings 7. Develop 3D view models 8. Prepare auxiliary views 9. Prepare section views 10. Complete drawing dimensions 11. Apply lettering and basic annotation to drawings 12. Revise draft drawings 13. Participate on an engineering project

POST-SECONDARY PATHWAY OPPORTUNITIES

There are several post-secondary pathway opportunities in this area. The following is a partial list.

- Civil Engineering Technology
- Mechanical Design Technology



Engineering Drafting

Youth Apprenticeship

ON-THE-JOB LEARNING PERFORMANCE STANDARDS GUIDE (TO BE COMPLETED BY YA CONSORTIUM)

YOUTH APPRENTICE INFORMATION

Youth Apprentice Name	
YA Coordinator	YA Consortium
School District	High School Graduation Date

REQUIREMENTS

Level One Requirements

Youth apprentices must complete ALL the items listed below. Check completed areas.

- ☐ Competency checklist
- ☐ Employability Skills checklist (in this OJL Guide) or the DPI Employability Skills Certificate
- ☐ Related instruction equal to 1 high school credit or at least 3 college credits
- ☐ Minimum of 450 work hours

HOURS

Record the hours the youth apprentice worked.

Total Hours Employed	Company Name	Telephone Number

RELATED INSTRUCTION

YEAR 1: Indicate which related instruction courses the youth apprentice completed.

Dual Credit	Course Number and Title	Credits	Instruction Provider
☐			
☐			
☐			
☐			

SIGNATURES

The On-the-Job Learning Performance Standards Guide includes a list of competencies youth apprentices learn through mentoring and training at the worksite.

Instructions for the Worksite Employers/Mentors and School-Based or YA coordinators: This document should be reviewed with the employer/mentor, school-based or YA coordinator on a regular basis with the youth apprentice to record progress and plan future steps to ensure completion of the required competencies. Mentors, school-based/YA coordinator, and the apprentice sign below.

Employer/Mentor Signature	Employer/Mentor Signature
Employer/Mentor	Employer/Mentor
Business/Company	Business/Company
Date Signed	Date Signed
School-Based and/or YA Coordinator Signature	School-Based and/or YA Coordinator Signature
School-Based and/or YA Coordinator	School-Based and/or YA Coordinator
School District or Organization	School District or Organization
Date Signed	Date Signed
Youth Apprentice Signature	Youth Apprentice Signature
Youth Apprentice	Youth Apprentice
School District / High School	School District / High School
Date Signed	Date Signed

EMPLOYABILITY SKILLS (TO BE COMPLETED BY YA EMPLOYER/MENTOR)

Youth apprentices must demonstrate key employability skills.

The DWD YA program employability skills requirement may be attained and demonstrated through two processes. (See options listed below.) Employability skills must be completed for every year a student is in the program. The DPI Employability Skills Certificate may be counted as meeting one of those two years, provided the certificate is earned in the same year the student is enrolled in youth apprenticeship or they can complete the YA Employability Skills in the OJL. The Employability Skills Certificate must be obtained through the DPI.

1. If a student has successfully completed a Wisconsin Department of Public Instruction (DPI) State-Certified Cooperative Education, [Co-Op Employability Skill certification](#) then they have met the YA Employability Skills requirement for that year. A copy of the student's DPI Co-Op Employability Skill Certificate must be maintained on file with their YA regional consortium.

☐ Earned Wisconsin Employability Skills Certificate (checked if applicable) or,

2. Completed and rated "Employability Skills" through this YA OJL guide as described below.

3	Exceeds Expectations: Exceeds entry-level criteria; requires minimal supervision; consistently displays this behavior
2	Meets Expectations: Meets entry-level criteria; requires some supervision; often displays this behavior
1	Working to Meet Expectations: Needs improvement; requires much assistance and supervision; rarely displays this behavior

The following skills are required of all youth apprentices.

Employability Skills		Rating		
Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
		1	2	3
1. Develops positive work relationships with others. <i>Examples of qualities and habits that the employee might exhibit include . . .</i> • Interacts with others with respect and in a non-judgmental manner • Responds to others in an appropriate and non-offensive manner • Helps co-workers and peers accomplish tasks or goals • Applies problem-solving strategies to improve relations with others • When managing others, shows traits such as compassion, listening, coaching, team development, and appreciation		☐	☐	☐

Employability Skills		Rating		
Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
		1	2	3
2. Communicates effectively with others <i>Examples of qualities and habits that the employee might exhibit include . . .</i> • Adjusts the communication approach for the target audience, purpose, and situation to maximize impact • Organizes messages/information in a logical and helpful manner • Speaks clearly and writes legibly • Models behaviors to show active listening • Applies what was read to actual practice • Asks appropriate questions for clarity		☐	☐	☐
3. Collaborates with others <i>Examples of qualities and habits that the employee might exhibit include . . .</i> • Works effectively in teams with people of diverse backgrounds regardless of sex, race, ethnicity, nationality, sexuality, religion, political views, and abilities • Shares responsibility for collaborative work and decision making • Uses the problem-solving process to work through differences of opinion in a constructive manner to achieve a reasonable compromise • Avoids contributing to an unproductive group conflict • Shares information and carries out responsibilities in a timely manner		☐	☐	☐
4. Maintains composure under pressure <i>Examples of qualities and habits that the employee might exhibit include . . .</i> • Uses critical thinking to determine the best options or outcomes when faced with a challenging situation • Carries out assigned duties while under pressure • Acts in a respectful, professional, and non-offensive manner while under pressure • Applies stress management techniques to cope under pressure		☐	☐	☐
5. Demonstrates integrity <i>Examples of qualities and habits that the employee might exhibit include . . .</i> • Carries out responsibilities in an ethical, legal and confidential manner • Responds to situations in a timely manner • Takes personal responsibility to correct problems • Models behaviors that demonstrate self-discipline, reliability, and dependability		☐	☐	☐

Employability Skills		Rating		
Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
		1	2	3
6. Performs quality work <i>Examples of qualities and habits that the employee might exhibit include . . .</i> • Carries out written and verbal directions accurately • Completes work efficiently and effectively • Performs calculations accurately • Conserves resources, supplies, and materials to minimize costs and environmental impact • Uses equipment, technology, and work strategies to improve workflow • Applies problem-solving strategies to improve productivity • Adheres to worksite regulations and practices • Maintains an organized work area		☐	☐	☐
7. Provides quality goods or services (internal and external) <i>Examples of qualities and habits that the employee might exhibit include . . .</i> • Shows support for the organizational goals and principles by own personal actions • Displays a respectful and professional image to customers • Displays an enthusiastic attitude and desire to take care of customer needs • Seeks out ways to increase customer satisfaction • Produces goods to workplace specifications		☐	☐	☐
8. Shows initiative and self-direction <i>Examples of qualities and habits that the employee might exhibit include . . .</i> • Prioritizes and carries out responsibilities without being told • Responds with enthusiasm and flexibility to handle tasks that need immediate attention • Reflects on any unsatisfactory outcome as an opportunity to learn • Improves personal performance by doing something different or differently • Analyzes how own actions impact the overall organization • Supports own action with sound reasoning and principles • Balances personal activities to minimize interference with work responsibilities		☐	☐	☐

Employability Skills		Rating		
Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
		1	2	3
9. Adapts to change <i>Examples of qualities and habits that the employee might exhibit include . . .</i> - Shows flexibility and willingness to learn new skills for various job roles - Uses problem-solving and critical-thinking skills to cope with changing circumstances - Modifies own work behavior based on feedback, unsatisfactory outcomes, efficiency, and effectiveness - Displays a "can do" attitude		☐	☐	☐
10. Demonstrates safety and security regulations and practices <i>Examples of qualities and habits that the employee might exhibit include . . .</i> - Follows personal safety requirements - Maintains a safe work environment - Demonstrates professional role in an emergency - Follows security procedures - Maintains confidentiality		☐	☐	☐
11. Applies job-related technology, information, and media <i>Examples of qualities and habits that the employee might exhibit include . . .</i> - Applies technology effectively in the workplace - Assesses and evaluates information on the job - Assesses training manuals, website, and other media related to the job		☐	☐	☐
12. Fulfills training or certification requirements for employment <i>Examples of this requirement may include . . .</i> - Participation in required career-related training and/or educational programs - Passing certification tests to qualify for licensure and/or certification - Participation in company training or orientation		☐	☐	☐
13. Sets personal goals for improvement <i>Examples of this requirement may include . . .</i> - Setting goals that are specific and measurable - Setting work-related goals that align with the organization's mission - Identifying strategies to reach goals - Reflecting on goal progress to regularly evaluate and modify goals		☐	☐	☐

OCCUPATIONAL COMPETENCIES

(TO BE COMPLETED BY YA EMPLOYER/MENTOR)

Youth apprentices must complete a **total of 13** competencies. **Eleven** must be from the list below. If necessary, employers can substitute **2** competencies with another occupationally appropriate skill. That skill should be added to the competency list for assessment.

Rating Scale

3: Exceeds entry level criteria | Requires minimal supervision | Consistently displays this behavior

2: Meets entry level criteria | Requires some supervision | Often displays this behavior

1: Needs improvement | Requires much assistance and supervision | Rarely displays this behavior

If any competencies are rated "1" on the final performance review checklist that is submitted to WI DWD it is considered a failed checklist.

Occupational Competencies		Ratings		
Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating			
	1	2	3	
1. Interpret technical drawings • use technical terminology • identify basic elements of technical drawings • identify lines, views, symbols, and representations on the drawings • interpret auxiliary drawing information • identify tolerancing symbols in a technical drawing • interpret dimensions and scale on the drawings • use metric scale to properly read a drawing	☐	☐	☐	
2. Use measuring devices • choose appropriate instrument or aid for measuring task • verify instrument is accurate for calibration • read measuring instrument accurately • scale proportions accurately • convert standard English measurement to metric and vice versa • apply formula and units for measurements • record measurements using symbols • clean and maintain instruments • store instrument(s) properly	☐	☐	☐	

Occupational Competencies		Ratings		
Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
		1	2	3
3. Organize databases, files, and drawings - select appropriate documents - code documents as required - save and store drawings and files to database - sort and retrieve drawings and data from databases - enter data and edit fields and documents - query to extract information from files and documents - create reports from queries - use appropriate computer codes, formatting, macros, charts, spreadsheets, etc. - verify data prior to entry/storage		☐	☐	☐
4. Reproduce documents and plans - save copies to computer storage devices - operate copy machines - operate printers, plotters, and scanners - number copies as required - document copies made		☐	☐	☐
5. Use engineering drafting software - use file management to search, create, copy, edit, and save drawing files - import/export drawings from/to various graphic formats - convert existing hard copy drawing to electronic format - draw or modify drawings - utilize drawing management standards - set up plot parameter - select appropriate scale - use coordinate systems - apply naming conventions, line types, and symbol/object management to drawing - apply notes and/or leaders to drawing - apply lettering, fonts, line thickness and type - check drawing - maintain drawings in the file management system		☐	☐	☐
6. Develop 2D (orthographic) view drawings - select proper views - identify types of lines for drawing - use line precedence - construct an orthographic drawing - show hidden features and centerlines - complete title block by selecting lettering style and size - apply proper thickness lines - check drawing - label and save to appropriate project		☐	☐	☐

Occupational Competencies		Ratings		
Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
		1	2	3
7. Develop 3D view models • select proper view • lay out view corner • identify lines to be used • determine and utilize line precedence • draw 3D view models • show hidden features and centerlines as required • complete title block by selecting lettering style and size • apply proper thickness to lines • check drawing • label and save to appropriate project		☐	☐	☐
8. Prepare auxiliary views • select proper auxiliary plane • prepare auxiliary drawing • complete title block by selecting lettering style and size • apply proper thickness to lines • check drawing • label and save to appropriate project		☐	☐	☐
9. Prepare section views • select proper section view • prepare section drawing • complete title block by selecting lettering style and size • apply proper thickness to lines • check drawing • label and save to appropriate project		☐	☐	☐
10. Complete drawing dimensions • select views to be dimensioned • dimension views to standard • create/draw dimension lines • dimension views using appropriate style of dimensioning (coordinated, linear) • dimension complex shapes when appropriate (e.g., spheres, cylinders, tapers, pyramids) • apply appropriate line thickness and type to dimension, extension, and center lines • check drawing • perform GDT (Geometric Dimensioning and Tolerancing)		☐	☐	☐

Occupational Competencies		Ratings		
Competency and Rating Criteria		Minimum Rating of 2 for EACH Check Rating		
		1	2	3
11. Apply lettering and basic annotation to drawings • add lettering • create/draw dimension and extension lines • apply adequate drawing notations • use appropriate abbreviations • apply finish marks • check drawing		☐	☐	☐
12. Revise draft drawings • obtain all material (catalogs, calculations, references) pertaining to drawn item • check dimensioning, tolerances, and references to other drawings • check for complete calculations and dimensioning on all required documents • check material specifications are given in detail • check that all necessary drawing views are included • check clearances and interference between moving and adjacent parts • check the parts list on assembly drawings for sizes, catalog information, material, etc. • check appropriate unit of scale is indicated • review drawing revision (change) procedures • identify drawing to be modified • use engineering drafting software or draw manually • make modifications to drawing • construct a revision table on drawing • record changes properly on revision table • apply appropriate line thickness and type • check revised drawing • record to appropriate project family • number all view drawings and supporting documents as required • document checks and revisions		☐	☐	☐

Occupational Competencies		Ratings		
Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating			
	1	2	3	
13. Participate on an engineering project • review the scope and phases of the design project with worksite professional • identify customer requirements • identify design specifications • research design constraints and criteria • identify possible design solutions with team • finalize design criteria and parameters • plan development process • evaluate project requirements • estimate required resources and budget • estimate time requirements • identify interdependencies • identify critical milestones • create model/prototype • test prototype • coordinate project steps with other project/departments • track critical milestones • track changes to engineering plans and costs • track progress of project • review plan activities completed and their results	☐	☐	☐	
Competency Substitute (if you replaced a competency above, note the competency and rating)	☐	☐	☐	
Competency Substitute (if you replaced a competency above, note the competency and rating)	☐	☐	☐	
Comments:				



Post-Program Completion Survey

Youth Apprenticeship

YA POST-PROGRAM COMPLETION SURVEY: **EMPLOYER FEEDBACK**

Employers complete the following information. YA Coordinators will enter this into the Post-Program Completion Survey.

YA Employer Post-Program Completion Questions	
Will you offer or have you offered the Youth Apprentice a continuing position with your company?	☐ Yes ☐ No
If continuing position offered to youth apprentice, did they accept?	☐ Yes ☐ No
If yes, please answer the questions below:	
Was the offer for full time or part time work?	☐ Full-time ☐ Part-time
Title of the position offered:	
What is the wage of the continuing employment offer?	
If applicable, will the youth apprentice advance to a Registered Apprenticeship?	

YA POST-PROGRAM COMPLETION SURVEY: **COMPLETED BY YA CONSORTIUM**

The [Post-Program Completion Survey](#) form is to be provided to each student completing the Youth Apprenticeship program to capture information on the student's plans after leaving the program. This **form should be completed by the Youth Apprenticeship Coordinator** to capture information from all high school seniors and their employers after successful completion of the Youth Apprenticeship Program.

The form should be completed during the final meeting between the student, mentor, and Youth Apprenticeship Coordinator, when the final checklist or On-the-Job Learning (OJL) Guide is filled out and signed. Information captured on this form must be entered online using the Bureau of Apprenticeship Standards Electronic Records System (BASERS).

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