**OHIO STATE APPRENTICESHIP COUNCIL**

**POLICY OF PRE-APPRENTICESHIP**

**COVER PAGE**

|  |  |
| --- | --- |
| **School Name** | **Vanguard-Sentinel Career & Technology Centers** |
| **District IRN** | **051458** |
| **School Address** | **1306 Cedar Street, Fremont, OH 43420** |
| **Contact** | **Rosemary Krieger** |
| **Title** | **Director** |
| **Phone** | **419-332-2626 X 2710** |
| **Email Address** | **rkrieger@vsctc.org** |
| **Date** | **October 27, 2017** |

**Updated 11/7/16**

**Definitions and Policy attached in Exhibit A.**



**Pre-Apprenticeship Operating Plan:**

**Vanguard-Sentinel Career & Technology Centers**

**1306 Cedar Street**

**Fremont, Ohio 43420**

**Secondary & Adult Education**

**FOR THE OCCUPATIONS OF:**

Construction Technology

Building Trades

Electrical Trades

Manufacturing

Engineering Technologies & Robotics

Precision Machining

Welding & Metal Fabrication

In cooperation with the Ohio State Apprenticeship Council

# Pre-Apprenticeship Operating Plan

1. **Equal Opportunity Pledge** – The recruitment, selection, employment and training of pre apprentices shall be conducted without discrimination because of race, color, religion, national origin, age, or sex. The program shall take affirmative action to provide equal opportunity in its Pre-apprenticeship program as outlined under Title 29 of the Code of Federal Regulations, Part 30; Ohio Administrative Code 5101:11 and the Equal Employment Opportunity regulations of the State of Ohio.
2. **Enrollment** –
   1. **School to Apprenticeship – Pre Apprenticeship (Secondary)**

This is an opportunity for selected Platinum-level students to work in an approved apprenticeship work placement with appropriate classes. All students who meet the eligibility criteria and who are enrolled in Vanguard-Sentinel Career and Technology Center technical programs that can be certified apprenticeship trades may request consideration for apprenticeship status for the Platinum year. For more information on this career path, a student should contact his/her Vanguard-Sentinel Career & Technology Center guidance counselor.

**Two Types of Programs:**

* + 1. Students who meet the eligibility requirements may begin work the summer before their Platinum year and continue to work full time during the course of the Platinum year. This option is for those students who have met all of their academic requirements or are meeting them outside the normal school day.
    2. Students who meet the eligibility requirements may begin work the summer before their Platinum year. Upon the beginning of the Platinum year students may work half day and return to their home/partner school the other half.

1. **Eligibility for trainees**:

The requirements to be accepted and maintain eligibility status into the pre-apprenticeship program are as follows:

a. Attain Platinum level status

i. Platinum level is the level earned after achieving either level two or level three

* + - 1. Maintain 95% attendance while enrolled in a pre-approved career-technical education program
      2. Have a minimum 2.5 GPA, a ‘B’ or better in their career-technical education program track for graduation
      3. Pass all required career center testing (industry credentials, Webxam, etc.)
      4. Have parental/guardian support and approval
      5. Demonstrate appropriate moral characteristics and professional appearance
      6. Receive a positive recommendation from their career-technical education instructor
      7. Have reliable transportation, a valid driver’s license and current auto insurance i. Have all school fees paid

j. Be a member of Drug Free Clubs of America

* 1. **Eligibility Exceptions:**

Attendance exception – hospital stay and/or something beyond student control

* 1. **Selection Methods:**

Any student who meets the eligibility requirements are eligible

* 1. **Selection Procedure Steps:**

A student who is enrolled and has completed level two of the career technical preapprenticeship program

**Step 1:** Student has met all eligibility requirements

**Step 2:** Application – verification of grades, GPA, attendance, credits, school fees, driver’s license, transportation, teacher recommendations, parent/guardian support, employed by an approved sponsor, and on track to complete Ohio’s graduation requirements

**Step 3:** Complete all necessary paperwork with signatures and approval

**Step 4:** Employment with an approved registered apprenticeship sponsor

**Step 5:** Employer paperwork and verification of all documents

* 1. **School to Apprenticeship – Pre Apprenticeship (Post-Secondary)**

This is an opportunity for adults to work in an approved apprenticeship work placement with appropriate classes. All students who meet the eligibility criteria and who are enrolled in Vanguard-Sentinel Career and Technology Center technical programs that can be certified apprenticeship trades may request consideration for apprenticeship status for the Platinum year. For more information on this career path, an adult student should contact Vanguard-Sentinel Career & Technology Center adult workforce development office.

**Program:**

Students who meet the eligibility requirements may begin work at an approved sponsor work site.

**Eligibility for trainees**:

The requirements to be accepted and maintain eligibility status into the pre-apprenticeship program are as follows:

1. Possess a GED or high school diploma
2. Maintain 95% attendance while enrolled in a pre-approved adult workforce development career-technical education program
3. Have a minimum 2.5 GPA, a ‘B’ or better in their adult workforce development careertechnical education program
4. Pass all required career center testing (industry credentials, work keys, etc.)
5. Demonstrate appropriate moral characteristics and professional appearance
6. Receive a positive recommendation from their adult workforce development careertechnical education instructor
7. Have reliable transportation, a valid driver’s license and current auto insurance h. Have all tuition and fees paid
8. **Eligibility Exceptions:**

Attendance exception – hospital stay and/or something beyond student control

1. **Selection Methods:**

Any student who meets the eligibility requirements are eligible

1. **Selection Procedure Steps:**

A student who is enrolled and has completed his/her adult workforce development career technical pre-apprenticeship program

**Step 1:** Student has met all eligibility requirements

**Step 2:** Application – verification of grades, GPA, attendance, credits, school fees, driver’s license, transportation, teacher recommendations, and employed by an approved sponsor

**Step 3:** Complete all necessary paperwork with signatures and approval

**Step 4:** Employment with an approved registered apprenticeship sponsor

**Step 5:** Employer paperwork and verification of all documents

**(C) Instructional Content**

1. **Apprenticeship Occupations:** 
   1. Building Trades
   2. Electrical Trades
   3. Engineering Technologies & Robotics
   4. Precision Machining
   5. Welding & Metal Fabrication

1. **Progressive Stages of Training:** 
   1. Successful completion of the gold level of training.
   2. Continued through Platinum level of training.
   3. Successful completion of the adult workforce development career-technical training
   4. Continued skills learning on the job with an approved individual training plan by employer/school/student

1. **Periodic Evaluations:** At school and on the job

At school – students will be graded as per district policies

On the job – students will be required to have a completed and detailed evaluation report filled out by employer and student

The bi-weekly evaluation report shall consist of: employer, student, and parent (for secondary students) input.

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| |  | | --- | | **TRAINING STATION RATING SHEET**  **VANGUARD-SENTINEL CAREER & TECHNOLOGY**  **CENTERS** | | |  | | --- | | **PLEASE RETURN THIS FORM TO ME BY:**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\*minimum every two weeks** | |

Student’s Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Program \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

This form is being used to aid the coordinator and employer in evaluating the needs and progress of the student-trainee. By offering constructive criticism, this will enable us to offer a better instruction program and to properly evaluate the student at the training station. **Please circle only items applying to studenttrainee. Please mark the items below according to the following scale:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **5–Excellent (A) 4–Good (B) 3–Average (C) 2–Fair (D)** | | | **1–Unsatisfactory (F)** | | |
|  **Attendance** …………………………………………………………................................. | 5 | 4 | 3 | 2 | 1 |
|  **Attitude**  -- Toward fellow workers ……………………………………………………………… | 5 | 4 | 3 | 2 | 1 |
| -- Toward supervisor ……………………………………………………………………. | 5 | 4 | 3 | 2 | 1 |
| -- Toward work …………………………………………………………………………..… | 5 | 4 | 3 | 2 | 1 |
| -- Toward following instructions ……………………………………………….…… | 5 | 4 | 3 | 2 | 1 |
|  **Observance of safety rules** ……………………………………………………….… | 5 | 4 | 3 | 2 | 1 |
|  **Quality of work (speed, proficiency, output)** ………………..................... | 5 | 4 | 3 | 2 | 1 |
|  **Care and use of tools, supplies, equipment, and machines** ….……… | 5 | 4 | 3 | 2 | 1 |
|  **Initiative to learn** …………………………………………………………………..…… | 5 | 4 | 3 | 2 | 1 |
|  **Appearance (neatness, cleanliness, dress)** …………………….…………… | 5 | 4 | 3 | 2 | 1 |
|  **Communication & Expression (clear, concise, pleasant)** ……………. | 5 | 4 | 3 | 2 | 1 |
|  **Problem solving/Analytical skills** …………………………………….…………. | 5 | 4 | 3 | 2 | 1 |

Remarks: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Supervisor’s Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Firm \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**WEEKLY WORK EXPERIENCE REPORT**

**VANGUARD-SENTINEL CAREER & TECHNOLOGY CENTERS**

Student \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Employer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Week of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Days Per Week: S M T W R F S (circle) Total Hours \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\* **Students**: You must complete this form and return it to your instructor every Friday or Monday, depending on program (MANDATORY). Briefly describe what you did each day.

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Training Station Supervisor’s Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Vanguard-Sentinel Career and Technology Centers

Employer paperwork (1) – Site visit, sign, copy, and file document

Employer bi-weekly/student weekly reports – collect, copy, distribute to lab instructor or

adult workforce development instructor for a grade and file

Site visits and communicate with employer at a minimum of 1 time per quarter

**4. Instructional Design:**

1. Alignment with prevailing industry standards for each apprenticeship occupational career technical program:
   * Vanguard-Sentinel Career and Technology Center School Board & Advisory

Committee approved/adopted course of study, syllabus, and course sequence

* + Ohio Department of Education CTE Career Field Technical Content Standards
  + University System of Ohio curriculum standards

1. Competencies Framework:

# Construction Technologies Career Field

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## Construction Technologies Career Field

**Curriculum Mapping**

**Junior Level Program**

|  |  |  |
| --- | --- | --- |
| Week | Technical Content | Course  Name/Outcome |
| 1 | Lab Orientation  Bus Evacuation and Safety Procedures  Pre Testing | VSCTC  ORC  VSCTC |
| 2 | Employability Skills.1.1.1-1.1.12  Leadership and Communication/Character Education 1.2.1-1.2.14 | 178000 |
| 3 | Personal Safety 2.2.1-2.2.5  Maintenance Operations 7.5.5  Leadership and Communication/Character Education 1.2.1-1.2.14 | 178000 |
| 4 | Personal Safety 2.2.1-2.2.6  Business Ethics and Law 1.3.1-1.3.9 | 178001  178000 |
| 5 | Construction Drawings 6.4.2-6.4.4  Brick, Block and Concrete 3.1.1, 3.1.3, 3.1.4, 3.1.8, 3.1.9, 3.1.11  Site Safety 2.1.1-2.1.14 | 178000  178001  178000 |
| 6 | Construction Drawings 6.4.2-6.4.4  Brick, Block and Concrete 3.1.1, 3.1.3, 3.1.4, 3.1.8, 3.1.9, 3.1.11  Site Safety 2.1.1-2.1.14 | 178000  178001  178001 |
| 7 | Construction Math 6.5.1-6.5.4  Global Environment 1.5.1-1.5.8  Field Organization 7.2.7 | 178003  178000  178000 |
| 8 | Floor Framing 3.4.1, 3.4.4-3.4.7  Construction Scheduling 7.1.1-7.1.5 | 178003  178000 |
| 9 | Floor Framing 3.4.1, 3.4.4-3.4.7 | 178003 |
| 10 | Wall Framing 3.5.2-3.5.8, 3.5.10 | 178003 |

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|  | Business Literacy 1.6.1-1.6.12 | 178000 |
| 11 | Wall Framing 3.5.2-3.5.8, 3.5.10  Financial Management 1.9.1-1.9.10 | 178003  178000 |
| 12 | Wall Framing 3.5.2-3.5.8, 3.5.10 | 178003 |
| 13 | Stairs 3.8.1-3.8.3  Knowledge Management and Information Technology 1.4.1-1.4.8 | 178003  178000 |
| 14 | Excavation 3.3.1, 3.3.2, 3.3.5-3.3.7, 3.3.10-3.3.12 | 178003 |
| 15 | Roof Framing 3.6.1-3.6.5, 3.6.7, 3.7.8, 3.6.10, 3.6.11 | 178003 |
| 16 | Roof Framing 3.6.1-3.6.5, 3.6.7, 3.7.8, 3.6.10, 3.6.11 | 178003 |
| 17 | Roof Framing 3.6.1-3.6.5, 3.6.7, 3.7.8, 3.6.10, 3.6.11 | 178003 |
| 18 | Roof Framing 3.6.1-3.6.5, 3.6.7, 3.7.8, 3.6.10, 3.6.11  Bus Evacuation Procedures | 178003  ORC |
| Semester Exams | | |
| 19 | Bus Evacuation and Safety Procedures  Exterior Finish Work 3.7.2, 3.7.8 | ORC  178004 |
| 20 | Exterior Finish Work 3.7.2, 3.7.8  Personal Safety 2.2.1-2.2.5 | 178004 |
| 21 | Exterior Finish Work 3.7.2, 3.7.8  Personal Safety 2.2.1-2.2.5 | 178004 |
| 22 | Exterior Finish Work 3.7.2, 3.7.8  Site Safety 2.1.1-2.1.3, 2.1.6-2.1.11, 2.1.14 | 178004 |
| 23 | Exterior Finish Work 3.7.2, 3.7.8  Site Safety 2.1.1-2.1.3, 2.1.6-2.1.11, 2.1.14 | 178004 |
| 24 | Site Management 3.2.1-3.2.3  Maintenance Operations 7.5.5 | 178001  178000 |
| 25 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 26 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 27 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 28 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 29 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 30 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 31 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 32 | Construction Drawings 6.4.2-6.4.4 | 178004 |
| 33 | Construction Math 6.5.1-6.5.4  Field Organization 7.2.7 | 178004  178000 |
| 34 | Post Testing/Industry Certifications | VSCTC |
| 35 | Maintenance Operations 7.5.5 | 178000 |
| 36 | Leadership and Communication 1.2.1-1.2.14 | 178000 |
|  | Semester Exams |  |

## Construction Technologies Career Field

**Curriculum Mapping**

**Senior Level Program**

|  |  |  |
| --- | --- | --- |
| Week | Technical Content | Course  Name/Outcome |
| 1 | Lab Orientation  Bus Evacuation and Safety Procedures  Pre Testing | VSCTC  ORC  VSCTC |
| 2 | Employability Skills.1.1.1-1.1.12  Leadership and Communication/Character Education 1.2.1-1.2.14  Personal Safety 2.2.1-2.2.6 | 178000 |
| 3 | Excavation 3.3.1, 3.3.2, 3.3.5-3.3.7, 3.3.10-3.3.12  Site Safety 2.1.1-2.1.14 | 178003  178001 |
| 4 | Construction Drawings 6.4.2-6.4.4  Brick, Block and Concrete 3.1.1, 3.1.3, 3.1.4, 3.1.8, 3.1.9, 3.1.11 | 178001 |
| 5 | Construction Math 6.5.1-6.5.4  Brick, Block and Concrete 3.1.1, 3.1.3, 3.1.4, 3.1.8, 3.1.9, 3.1.11 | 178001 |
| 6 | Site Management 3.2.1-3.2.3  Floor Framing 3.4.1, 3.4.4-3.4.7 | 178001 |
| 7 | Site Management 3.2.1-3.2.3  Floor Framing 3.4.1, 3.4.4-3.4.7 | 178001 |
| 8 | Construction Scheduling 7.1.1-7.1.5  Floor Framing 3.4.1, 3.4.4-3.4.7 | 178001 |
| 9 | Construction Scheduling 7.1.1-7.1.5  Wall Framing 3.5.2-3.5.8, 3.5.10 | 178001 |
| 10 | Wall Framing 3.5.2-3.5.8, 3.5.10 | 178001 |
| 11 | Wall Framing 3.5.2-3.5.8, 3.5.10 | 178001 |
| 12 | Wall Framing 3.5.2-3.5.8, 3.5.10 | 178001 |

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| 13 | Wall Framing 3.5.2-3.5.8, 3.5.10 | 178001 |
| 14 | Roof Framing 3.6.1-3.6.11 | 178001 |
| 15 | Roof Framing 3.6.1-3.6.11 | 178001 |
| 16 | Roof Framing 3.6.1-3.6.11 | 178001 |
| 17 | Roof Framing 3.6.1-3.6.11 | 178001 |
| 18 | Roof Framing 3.6.1-3.6.11  Bus Evacuation and Safety Procedures  Industry Certification Testing | 178001  ORC |
| Semester Exams | | |
| 19 | Site Safety 2.1.1-2.1.14  Exterior Finish Work 3.7.2, 3.7.8 | 178004 |
| 20 | Exterior Finish Work 3.7.2, 3.7.8  Construction Drawings 6.4.2-6.4.4 | 178004  178001 |
| 21 | Exterior Finish Work 3.7.2, 3.7.8  Construction Drawings 6.4.2-6.4.4 | 178004  178001 |
| 22 | Exterior Finish Work 3.7.2, 3.7.8 | 178004 |
| 23 | Exterior Finish Work 3.7.2, 3.7.8 | 178004 |
| 24 | Construction Drawings 6.4.2-6.4.4  Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 25 | Construction Drawings 6.4.2-6.4.4  Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 26 | Construction Math 6.5.1-6.5.4  Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 27 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 28 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 29 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 30 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 31 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 32 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 33 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 34 | Interior Finish Work 3.9.1-3.9.13, 3.9.15 | 178004 |
| 35 | Post Testing  Industry Certification Testing | VSCTC |
| 36 | Leadership and Communication 1.2.1-1.2.14 | 178000 |
|  | Semester Exams |  |

# Electrical Trades

## Electrical Trades

**Curriculum Mapping**

**Junior Level Program**

|  |  |  |
| --- | --- | --- |
| Week | Technical Content | Course  Name/Outcome |
| 1 | ***Lab orientation*** | Layout and safety |
| 2 | 1.1.1 - 1.1.12 ***Team Building***, Employability skills | 178000 |
| 3 | 1.2.1 - 1.2.14, 1.3.1 – 1.3.9, 1.5.1 – 1.5.8 ***Character Ed***, leadership and communication, Business  Ethics and laws, global environment. | 178000 |
| 4 | 1.4.1 – 1.4.8 ***Intro to the trade***, knowledge management  7.1.1 – 7.1.5 Construction scheduling  7.2.7 Field Organization | 178000 |
| 5 | 2.1.1 – 2.1.14 Site ***safety*** (OSHA based)  2.2.1 – 2.2.6 Personal ***safety*** (OSHA based)  7.5.5 Maintenance operation | 178000  178009  178008  178007 |
| 6 | 6.4.2 – 6.4.4 Construction drawings | 178000 |
| 7 | First Aide, CPR | 178000  178009  178008  178007 |
| 8 | 2.4.1 – 2.4.10 Preventative maintenance construction system  2.4.1 – 2.4.10 Preventative maintenance residential construction | 178009  178008 |
| 9 | 6.5.1 – 6.5.4 Construction math | 178000  178009  178008 |
| 10 | 4.1.1 – 4.1.4 Electrical Theory | 178009 |

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| 11 | 4.1.5 – 4.1.7 Electrical Theory | 178009 |
| 12 | 4.2.1 – 4.2.3 Circuits | 178009 |
| 13 | 4.4.4 - 4.2.6 Circuits | 178009 |
| 14 | 4.3.1 Codes nec  4.5 Electrical wiring | 178009 |
| 15 | 4.3.2 Codes nec  4.5 Electrical wiring | 178009 |
| 16 | 4.3.3 Codes nec  4.5 Electrical wiring | 178009 |
| 17 | 4.3.2 Codes nec  4.5 Electrical wiring | 178009 |
| 18 | 1.6.1 – 1.6.12, 1.9.1 – 1.9.10 ***Financial***, Business and personal | 178000 |
| Semester Exams | | |
| 19 | 2.4.1 – 2.4.10 Equipment preventative maintenance | 178008 |
| 20 | 4.5 Electrical wiring  4.1.1 – 4.1.7 Electrical Theory | 178009  178008 |
| 21 | 4.5 Electrical wiring  4.2.1 – 4.2.6 Circuits | 178009  178008 |
| 22 | 4.5 Electrical wiring  4.3.1 – 4.3.3 Codes nec | 178009  178008 |
| 23 | 4.5 Electrical wiring  6.4.1 – 6.4.4 Constriction drawing | 178009  178008 |
| 24 | 4.5 Electrical wiring  6.5.1 – 6.5.4 Construction math | 178009  178008 |
| 25 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 26 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 27 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 28 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 29 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 30 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 31 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 32 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 33 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 34 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 35 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| 36 | 4.5 Electrical wiring…site related  (residential) | 178009  178008 |
| Semester Exams | | |

## Electrical Trades

**Senior Level Program**

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| Week | Technical Content | Course  Name/Outcome |
| 1 | ***Lab orientation*** | 178000 ET2 review |
| 2 | 1.1.1 - 1.1.12 ***Team Building***, Employability skills, | 178000 ET2 review |
| 3 | 1.2.1 - 1.2.14, 1.3.1 – 1.3.9, 1.5.1 – 1.5.8 ***Character Ed***, leadership and communication, Business  Ethics and laws, global environment.  1.4.1 – 1.4.8 ***Intro to the trade***, knowledge management | 178000 ET2 review |
| 4 | 2.4.1 – 2.4.10 Preventive maintenance ***Industrial*** | 178007 |
| 5 | 6.5.1 – 6.5.4 Construction math ***Industrial*** | 178007 |
| 6 | 2.1.1 – 2.1.14 Site ***safety Industrial*** (OSHA based)  2.2.1 – 2.2.6 Personal ***safety Industrial*** (OSHA based) | 178007  178007 |
| 7 | 6.4.2 – 6.4.4 Construction drawings I***ndustrial*** | 178007 |
| 8 | 4.2.2 – 4.2.9 Circuits  ***Industrial*** | 178007 |
| 9 | 4.4.10 – 4.2.14 Circuits ***Industrial*** | 178007 |
| 10 | 4.3.1 Codes ***Commercial, Industrial*** | 178007 |
| 11 | 4.3.2 Codes ***Commercial, Industrial*** | 178007 |
| 12 | 4.3.3 Codes ***Commercial, Industrial*** | 178007 |
| 13 | 4.6.1 Motors and Power ***Industrial*** | 178007 |
| 14 | 4.6.2 Motors and Power ***Industrial*** | 178007 |
| 15 | 4.6.3 Motors and Power ***Industrial*** | 178007 |
| 16 | 4.6.4 Motors and Power ***Industrial*** | 178007 |
| 17 | 4.6.5 Motors and Power ***Industrial*** | 178007 |
| 18 | 4.6.6 Motors and Power ***Industrial*** | 178007 |
| Semester Exams | | |

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| 19 | 4.6.7 Motors and Power ***Industrial*** | 178007 |
| 20 | 4.6.8 Motors and Power  ***Industrial*** | 178007 |
| 21 | 4.6.8 Motors and Power ***Industrial*** | 178007 |
| 22 | 4.6.9 Motors and Power ***Industrial*** | 178007 |
| 23 | 4.5 Electrical wiring…site related | 178007 |
| 24 | 4.5 Electrical wiring…site related | 178007 |
| 25 | 4.5 Electrical wiring…site related | 178007 |
| 26 | 4.5 Electrical wiring…site related | 178007 |
| 27 | 4.5 Electrical wiring…site related | 178007 |
| 28 | 4.5 Electrical wiring…site related | 178007 |
| 29 | 4.5 Electrical wiring…site related | 178007 |
| 30 | 4.5 Electrical wiring…site related | 178007 |
| 31 | 4.5 Electrical wiring…site related | 178007 |
| 32 | 4.5 Electrical wiring…site related | 178007 |
| 33 | 4.5 Electrical wiring…site related | 178007 |
| 34 | 4.5 Electrical wiring…site related | 178007 |
| 35 | 4.5 Electrical wiring…site related | 178007 |
| 36 | 4.5 Electrical wiring…site related | 178007 |
| Semester Exams | | |

# Engineering Technologies and Robotics

## Engineering Technologies and Robotics

**Curriculum Mapping**

**Junior Level Program**

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| --- | --- | --- | --- |
| Week | Technical Content | | Course Name |
| 1 | Outcome: 1.1.    7.1.2.  7.1.6.  7.1.7.  standards  7.1.9.  7.2.3.  7.2.4. | Employability Skills  Identify and rectify or mitigate hazards associated with walking surfaces, working surfaces and lighting.  Identify source of electrical and mechanical hazards and use shut‐down and established lock out/tag out procedures.  Identify and eliminate worksite clutter in accordance with for cleanliness and safety.  Identify the location of emergency flush showers, eyewash fountains, Safety Data Sheets (SDSs), fire alarms and exits.  Select, use, store, maintain and dispose of personal protective equipment (PPE) appropriate to job tasks, conditions and materials.  Identify workplace risk factors associated with lifting, operating and moving heavy objects and establish an ergonomics process. | All courses    Robotics,  Manufacturing  Operations |
| 2 | 2.1.1 Describe the structure of atoms and their relationship to electricity.  2.1.2 Compare and contrast electrical and electromagnetic effect.  2.1.3 Explain methods of producing electrical current.  2.1.4 Explain how batteries store and disperse energy.  2.8.2 Select a battery based on composition, environment, and circuit characteristics. | | Robotics and  Manufacturing Operations |

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|  | 2.1.5 Compare and contrast alternating current (AC) and direct current (DC).  2.3.1. Explain the role of Underwriters Laboratory (UL), Canadian Standards Association (CSA), and Intertek Testing Service/Edison Testing Laboratory (ITS/ETL).  Outcome: 5.2. Sketching and Visualization – ongoing  Outcome: 5.4. Computer‐Aided Drafting - ongoing | Manufacturing  Operations |
| 3 | 2.1.6 Define the units of measurement for voltage, current, power, and resistance.  2.1.7 Describe the relationships between voltage, current, resistance, and power in circuits. | Robotics and  Manufacturing  Operations |
| 4 | 2.1.8 Determine voltage, current, resistance, and power in circuits using Ohm’s Law, Kirchhoff’s Law, and Watt’s Law.  2.2.8 Explain the uses of series, parallel, and series-parallel circuits.  2.2.9 Construct and troubleshoot series, parallel, and seriesparallel circuits. | Robotics and  Manufacturing  Operations |
| 5 | Outcome: 1.2. Leadership and Communications    2.2.8 Explain the uses of series, parallel, and series-parallel circuits.  2.2.9 Construct and troubleshoot series, parallel, and seriesparallel circuits. | All courses    Robotics and  Manufacturing  Operations |
| 6 | 2.2.8 Explain the uses of series, parallel, and series-parallel circuits.  2.2.9 Construct and troubleshoot series, parallel, and seriesparallel circuits. | Robotics and  Manufacturing  Operations |
| 7 | 2.1.14 Compare peak (PK), root mean square (RMS), and average values. | Robotics and  Manufacturing  Operations |
| 8 | 2.1.10 Evaluate frequency and phase. | Robotics and  Manufacturing  Operations |

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| 9 | 2.1.11 Identify methods of varying capacitance. | Robotics and  Manufacturing  Operations |
| 10 | Outcome: 1.3. Business Ethics and Law    2.1.12 Calculate true power, apparent power, reactive power, and power factor.  2.1.13 Determine impedance. | Robotics and  Manufacturing  Operations |
| 11 | 2.1.9 Describe the purpose of grounding and common methods used for grounding  2.2.10 Analyze wiring schematics and diagrams for accuracy and function. | Robotics and  Manufacturing  Operations |
| 12 | 2.8.1 Identify the differences between transformer-powered supplies and line-connected supplies.  2.8.4 Construct and install regulated power supplies.  Outcome: 5.5 Materials | Robotics and  Manufacturing  Operations |
| 13 | Outcome: 2.9. Motors and Power: | Robotics |
| 14 | Outcome: 2.9. Motors and Power: | Robotics |
| 15 | Outcome: 1.4. Knowledge Management and Information  Technology    2.6.5 Describe the purpose and operation of programmable logic devices (PLDs) and complex programmable logic devices (CPLDs).  2.6.6 Describe the purpose and use of asynchronous and synchronous counters.  2.6.8 Explain the purpose and use of a digital bus.  2.6.10. Identify the numbering systems, codes, arithmetic operations, Boolean operations, and simplification methods used in digital electronics.  3.3.1. Identify PLCs.  3.3.2. Design a PLC program. | All courses      Robotics |

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|  | 3.3.3. Describe the use of PLCs in manufacturing automation.  3.3.4. Apply and execute a ladder logic program. |  |
| 16 | 3.3.5. Design a motor control program using manual and automatic modes.  3.3.6. Monitor and troubleshoot a hard-wired system with a PLC.  3.3.7. Monitor PLC operation using systems control dialog. | Robotics |
| 17 | Outcome: 1.5. Global Environment    2.7.1. Describe the types, purposes, and uses of cables and wires.  2.7.2. Identify the construction, impedance characteristics, and use of cables and wires.  2.7.3. Explain how the characteristics of cables and wires cause impedance. | All courses    Robotics |
| 18 | 2.7.4. Select methods for splicing and terminating cables and wires.  2.7.5. Splice and terminate cables and wires.  2.7.6. Test cables and wires. | Robotics |
| Semester Exams | | |
| 19 | 6.1.1. Identify measuring tools and gradations used in precision machining and their purposes.  6.1.2. Identify typical measurements in precision machining (e.g., angles, diameter, hardness).  6.1.3. Identify measuring systems and convert between systems.  Outcome: 5.3 Computer-Aided Modeling – ongoing throughout the semester. | Machine  Tools, Milling, Turning, CNC      Mfg. Ops. |
| 20 | Outcome: 1.5. Global Environment    6.1.4. Measure and inspect work pieces according to product specifications.  6.1.5. Identify information and symbols typically provided in drawings and specifications. | All courses    Machine  Tools, Milling,  Turning, CNC |

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| 21 | 6.2.1. Determine product requirements, dimensions and tolerances from drawing and specifications.  6.2.2. Determine process steps (e.g., cut, drill, turn, mill, grind, heat treat).  6.2.3. Plan individual process steps based on industry standards (e.g., manufacturers’ specifications,  Machining standards).  6.2.4. Schedule machining equipment as required. | | All courses    Machine  Tools, Milling,  Turning |
| 22 | 6.4.1.  6.4.2. cutting  6.4.3.  6.4.4.  6.4.5.  6.4.6. | Identify the type of material and apertures required in  product specifications.  Select drill, bit, work‐holding devices, speeds, feeds and fluids.  Configure the drilling equipment.  Prepare work pieces for drilling.  Drill the materials.  Inspect the work to meet requirements. | Machine  Tools, Milling,  Turning |
| 23 | 6.3.1. specific  6.3.2. feeds a  6.3.3.  6.3.4.  6.3.5.  6.3.6. | Identify the type of material and cuts required in product ations.  Select cutting equipment, work‐holding devices, speeds, nd cutting fluids.  Configure the cutting equipment.  Prepare work pieces for cutting.  Cut the materials.  Inspect the work to meet requirements. | Machine  Tools, Milling,  Turning |
| 24 | 6.6.1.  product  6.6.2. fluids.  6.6.3.  6.6.4.  6.6.5. | Identify the type of material and milling required in specifications.  Select milling machine, bit, chucks, speeds and cutting  Configure the milling equipment.  Prepare work pieces for milling.  Mill the materials. | Machine Tools, Milling |

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|  | 6.6.6. Inspect the work to meet requirements.  Outcome: 5.6 Production and Process Design - ongoing | | Manufacturing  Operations |
| 25 | Outcome: 1.6.    6.5.1.  product  6.5.2. fluids.  6.5.3.  6.5.4.  6.5.5.  6.5.6. | Business Literacy  Identify the type of material and turning required in specifications.  Select turning machine, bit, chucks, speeds and cutting  Configure the turning equipment.  Prepare work pieces for turning.  Turn the materials.  Inspect the work to meet requirements. | All courses    Machine  Tools, Turning |
| 26 | 6.8.1.  equipm docum  6.8.2. grindin lubricat  6.8.3.  6.8.4.  6.8.5.  6.8.6. | Identify equipment maintenance requirements in the ent manufacturer’s entation.  Identify maintenance tasks required (e.g., inspecting, g, sharpening, dressing, ing, cleaning).  Verify measuring tool accuracy and recalibrate as needed.  Develop a preventive maintenance schedule.  Monitor equipment performance during use.  Repair or replace equipment and accessories as needed. | Machine  Tools, Milling,  Turning, CNC |
| 27 | 6.7.1. Identify the type of material and grinding required in product specifications.  6.7.2. Select grinding machine, wheels, work‐holding devices, speeds and cutting fluids.  6.7.3. Configure the grinding equipment.  6.7.4. Prepare work pieces for grinding.  6.7.5. Grind the materials.  6.7.6. Inspect the work to meet requirements. | | Machine  Tools, Milling,  Turning |
| 28 | 7.1.1. Use Occupational Safety and Health Administration (OSHA)‐defined procedures for identifying employer and employee responsibilities, working in confined spaces, managing worker safety programs, using ground fault circuit interrupters (GFCIs), maintaining clearance and boundaries and labeling. | | All courses |
| 29 | 7.1.8. Identify procedures for the handling, storage and disposal of hazardous materials. | | All courses |
| 30 | Outcome: 1.9. Financial Management    7.1.10. Select and operate fire extinguishers based on the class of fire.  7.1.11. Identify the components of a hazardous materials safety plan.  7.1.12. Create a hazardous materials safety plan.  7.1.13. Set up for ergonomic workflow. | | All courses |
| 31 | 7.2.1. Interpret personal safety rights according to the employee Right to Know plan. | | All courses |
| 32 | 7.2.4. Identify workplace risk factors associated with lifting, operating and moving heavy objects and establish an ergonomics process.  7.2.5. Identify, inspect and use safety equipment appropriate for a task.  7.2.6. Use safe practices when working with electrical, mechanical, or other equipment. | | All courses |
| 33 | Outcome: 3.4 Power Technologies | | Mfg. Ops |
| 34 | Outcome: 3.5 Pumping Systems | | Mfg. Ops |
| 35 | Outcome: 3.6 Transmission Systems | | Mfg. Ops |
| 36 | Review and WebXam testing | |  |
| Semester Exams | | | |

## Engineering Technologies and Robotics

**Senior Level Program**

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| Week | Technical Content | | Course  Name/Outcome |
| 1 | 3.1.6.  7.1.2.  7.1.6.  7.1.7.  7.1.9.  7.2.3.  7.2.4. | Set up and operate CNC milling/turning machines.  Identify and rectify or mitigate hazards associated with walking surfaces, working surfaces and lighting.  Identify source of electrical and mechanical hazards and use shut‐down and established lock out/tag out procedures.  Identify and eliminate worksite clutter in accordance with standards for cleanliness and safety.  Identify the location of emergency flush showers, eyewash fountains, Safety Data Sheets (SDSs), fire alarms and exits.  Select, use, store, maintain and dispose of personal protective equipment (PPE) appropriate to job tasks, conditions and materials.  Identify workplace risk factors associated with lifting, operating and moving heavy objects and establish an ergonomics process. | CNC |
| 2 | 3.1.5. Work from a process sheet and part print.    3.2.1. Identify the components of a robot system and explain their roles in the robot’s operation cycle. | | CNC    Robotics |
| 3 | 3.1.3. Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances.  3.2.3. Use the robotic systems classification scheme to select an industrial robot. | | CNC        Robotics |
| 4 | 3.1.2. Plan a CNC production process for jobs in a machining cell. | | CNC |

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|  | 3.2.5. Plan, program, and test a robotic work cell using teach pendant and simulation software. | Robotics |
| 5 | 3.1.1. Maintain CNC milling/turning machine components and controllers. | CNC |
| 6 | 3.1.3. Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances.  3.1.4. Create a tool setup sheet.    3.2.4. Use job specifications to create programs for robot operations, sensors, and feeder systems | CNC          Robotics |
| 7 | 3.1.3. Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances.    3.1.7. Monitor the operations of a machining cell and troubleshoot problems that arise. | CNC        CNC, Robotics |
| 8 | 3.1.8. Verify part quality against job specifications.    3.2.8. Identify home position (fixed and floating zero) using absolute and incremental coordinates. | CNC    Robotics |
| 9 | 3.1.3. Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances.  3.1.4. Create a tool setup sheet. | CNC |
| 10 | 3.2.2. Maintain robot components and controllers. | Robotics |
| 11 | 3.1.3. Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances.  3.1.4. Create a tool setup sheet. | CNC |

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|  | 3.2.10. Identify the robot’s work envelope and apply the concepts of reach and articulation to evaluate whether a robot is suited to an application. | | Robotics |
| 12 | 3.2.4. Use job specifications to create programs for robot operations, sensors, and feeder systems | | Robotics |
| 13 | 3.1.3. Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances.  3.1.4. Create a tool setup sheet. | | CNC |
| 14 | 3.2.6. Identify the robot’s payload and identify the concepts of payload weight, moment, and inertia to select an appropriate robot. | | Robotics |
| 15 | 3.2.7. Use robot speed specifications to calculate estimated cycle times for sample tasks. | | Robotics |
| 16 |  | | Robotics |
| 17 | 3.2.9. Compare and contrast various robotic applications and processes (e.g., pick and place, welding). | | Robotics |
| 18 | 3.1.1. Maintain CNC milling/turning machine components and controllers. | |  |
|  | | Semester Exams | |
| 19 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 20 | 3.2.1.  3.1.3. | Analyze the performance and troubleshoot the operation of a robotic cell.  Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 21 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |

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| 22 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 23 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 24 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 25 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 26 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 27 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 28 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 29 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 30 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 31 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine | CAM  Programming |
|  |  | operations according to job specifications, dimensions and tolerances. |  |
| 32 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 33 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 34 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 35 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
| 36 | 3.1.3. | Create and edit CNC programs (e.g., G‐code, computeraided manufacturing [CAM]) for milling/turning machine operations according to job specifications, dimensions and tolerances. | CAM  Programming |
|  | | Semester Exams | |

# Precision Machine

## Precision Machine

**Curriculum Mapping**

**Junior Level Program**

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| --- | --- | --- |
| Week | Technical Content | Course  Name/Outcome |
| 1 | Shop safety:7.1 to 7.1.13 and grind tool for use in the lathes | 176006 |
| 2 | Identify measuring tools 6.1 to 6.1.2 | 176004 |
| 3 | Cut material to turn in lathe lathe 6.5 to 6.5.9 | 176007 |
| 4 | Safety in use of lathes7.2.1-7.2.6 Turn stock in lathe 6.5 to 6.5.9 | 176007 |
| 5 | Measuring tools, micrometers and scales 6.1.1and 6.1.2 | 176004 |
| 6 | Band saw operation , and cut off tools 6.3.6 to 6.3.6 | 176004 |
| 7 | Cut material for milling part in vertical mill 6.3.1 | 176006 |
| 8 | Machine part in milling machine 6.3.4 | 176006 |
| 9 | Measure part to blue print 6.3.5 | 176006 |
| 10 | Lay out techniques 6.2-6.3.4 | 176004 |
| 11 | Cross training with welding safety 7.1-07.1.13 and grind tool | 176006 |
| 12 | Cross training with welding Identify measuring tools 6.1 to 6.1.2 | 176004 |
| 13 | Cross training with welding Safety in use of lathes7.2.1-7.2.6 Turn stock in lathe 6.5 to 6.5.9 | 176007 |
| 14 | Cross training with welding Measuring tools, micrometers and scales 6.1.1and 6.1.2 | 176004 |
| 15 | Cross training with welding Band saw operation , and cut off tools  6.3.6 to 6.3.6 | 176004 |
| 16 | Drilling 6.2-6.3.4 | 176004 |
| 17 | Surface grinder 6.2-6.3.4 | 176004 |
| 18 | C.N.C. –Gibbs, C.A.M. package 3.1-3.1.8 | 176007 |
|  | Semester Exams |  |
| 19 | Sharpen drill bit 6.7 | 176004 |
| 20 | Maintain tools and equipment in working condition 6.8-6.8.6 | 176004 |
| 21 | Identify typical measurements in precision machining (e.g., angles, diameter, hardness 6.1.2 | 176004 |
| 22 | 6.1.3. Identify measuring systems and convert between systems. | 176004 |
| 23 | Cut threads and angles on lathe 6.5-6.5.6 | 176005 |
| 24 | Cut threads on C.N.C. lathe 3.1-3.1.8 | 176007 |
| 25 | Turn part on C.N.C. lathe 3.1-3.1.8 | 176007 |
| 26 | Turn angles and radius on C.N.C. lathe 3.1-3.1.8 | 176007 |
| 27 | Maintain tools and equipment in working condition.6.8-6.8.6 | 176007 |
| 28 | Draw part in C.A.D. 3.1-3.1.8 | 176007 |
| 29 | Handle materials, prevent accidents and mitigate hazards 7.1-  7.1.13 | 176007 |
| 30 | Create and edit CNC programs (e.g., G‐code, computer‐aided manufacturing [CAM]) for milling/turning 3.1 | 176007 |
| 31 | Create a tool setup sheet.3.1.4 | 176007 |
| 32 | Identify measuring systems and convert between systems6.1.1 | 176007 |
| 33 | Inspect the work to meet requirements6.3.6. | 176006 |
| 34 | Verify measuring tool accuracy and recalibrate as needed.6.8.3 | 176007 |
| 35 | Identify and eliminate worksite clutter in accordance with standards for cleanliness and safety.7.1.7 | 176007 |
| 36 | Monitor the operations of a machining cell and troubleshoot problems that arise3.1.7 | 176007 |
| Semester Exams | | |

## Precision Machine

**Senior Level Program**

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| Week | Technical Content | Course  Name/Outcome |
| 1 | Safety 7.1.-7.1.13 | 176005 |
| 2 | Order parts for senior project- Business Literacy1.6.13 | 176004 |
| 3 | Financial Management1.9-1.9.10 | 176004 |
| 4 | Measurement and Interpretation6.1-6.1.5 | 176004 |
| 5 | Create and edit CNC programs G‐code3.1 | 176007 |
| 6 | Setup and run CNC program in simulator 3.1.6 | 176007 |
| 7 | Set up and set offsets on CNC mill and lathe 3.1.6 | 176007 |
| 8 | Measurement and Interpretation: Interpret drawings and documentation and perform measurements. GD&T 6.1 | 176007 |
| 9 | Identify measuring systems and convert between6.1.3 | 176007 |
| 10 | Measure and inspect work pieces according to product specifications6.1.4 | 176007 |
| 11 | Identify equipment maintenance requirements in the equipment manufacturer’s  Documentation.6.8.1 | 176007 |
| 12 | Identify maintenance tasks required (e.g., inspecting, grinding, sharpening, dressing, lubricating, cleaning).6.8.2 | 176007 |
| 13 | Verify measuring tool accuracy and recalibrate as needed 6.8.3 | 176007 |
| 14 | Verify measuring tool accuracy and recalibrate as needed 6.8.4 | 176007 |
| 15 | Monitor equipment performance during use.6.8.5  6.8.6. Repair or replace equipment and accessories as needed | 176007 |
| 16 | Employability Skills 1.1to1.12 | 176007 |
| 17 | Leadership and Communications 1.2 to 1.1.14 | 176007 |
| 18 | Business Ethics and Law1.3 to 1.3.9 | 176007 |

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| Semester Exams | | |
| 19 | Knowledge Management and Information Technology 1.4.8 | 176007 |
| 20 | Business Literacy  Develop foundational skills and knowledge in entrepreneurship, financial literacy and business operations.1.6.12 | 176007 |
| 21 | 6.7.4. Prepare work pieces for grinding. | 176004 |
| 22 | 6.7.5. Grind the materials. | 176006 |
| 23 | 3.1.3. Create and edit CNC programs G‐code with startup and shut down codes | 176007 |
| 24 | 3.1.3--. 3.1.6. Create and edit CNC programs G‐code for a line | 176007 |
| 25 | 3.1.3.--- 3.1.6. Create and edit CNC programs G‐code for a circle interpolation | 176007 |
| 26 | 3.1.3.-- 3.1.6. Create and edit CNC programs (e.g., G‐code, computer‐aided manufacturing [CAM]) for  milling/turning machine operations according to job specifications, dimensions and  Tolerances. Draw up a part in Gibbs to be machined in a mill | 176007 |
| 27 | Setup tools on CNC-- set mill, set home and set tool offsets 3.1.6. | 176007 |
| 28 | Setup part origin –zero and set up offsets for x-zero , y- zero- zero 3.1.6. | 176007 |
| 29 | 3.1.4. Create a tool setup sheet. | 176007 |
| 30 | 3.1.7. Monitor the operations of a machining cell and troubleshoot problems that arise. | 176007 |
| 31 | 3.1.8. Verify part quality against job specifications. And setup offsets to fix problems | 176007 |
| 32 | 6.1. Measurement and Interpretation  Interpret drawings and documentation and perform measurements. | 176007 |
| 33 | 6.1.4. Measure and inspect work pieces according to product specifications. | 176007 |
| 34 | 6.1.5. Identify information and symbols typically provided in drawings and specifications. | 176007 |
| 35 | 6.8.3. Verify measuring tool accuracy and recalibrate as needed. | 176007 |
| 36 | 6.8.5. Monitor equipment performance during use.  6.8.6. Repair or replace equipment and accessories as needed. | 176007 |
|  | Semester Exams |  |

# Welding & Metal Fabrication

## Welding & Metal Fabrication

**Curriculum Mapping**

**NOTE:** While cognitive knowledge is taught sequentially as shown on the curriculum map, the shop skills involved are taught on an ongoing basis throughout the year. Students will develop shop skills by performing the various projects on a progress chart. The SMAW, GMAW, and thermal cutting skills will be developed simultaneously through the year. Similarly, evaluation of skills is done on a daily basis through the year.

**Junior Level Program**

|  |  |  |
| --- | --- | --- |
| Week | Technical Content | Course Name |
| 1 | Orientation/ PRE-TESTING |  |
| 2 | Shop Safety | GMAW,  FCAW,  GTAW, &  GMAW |
| 3 | Shop Safety |  |
| 4 | SMAW | SMAW |
| 5 | SMAW | SMAW |
| 6 | SMAW | SMAW |
| 7 | SMAW | SMAW |
| 8 | SMAW | SMAW |
| 9 | SMAW | SMAW |
| 10 | CROSS TRAIN WITH PRECISION MACHINING |  |
| 11 | CROSS TRAIN WITH PRECISION MACHINING |  |
| 12 | CROSS TRAIN WITH PRECISION MACHINING |  |
| 13 | CROSS TRAIN WITH PRECISION MACHINING |  |
| 14 | CROSS TRAIN WITH PRECISION MACHINING |  |
| 15 | CROSS TRAIN WITH PRECISION MACHINING |  |
| 16 | CAD | GMAW,  FCAW,  GTAW, &  GMAW |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 17 | CAD | | | GMAW,  FCAW,  GTAW, &  GMAW |
| 18 | CAD | | | GMAW,  FCAW,  GTAW, &  GMAW |
| Semester Exams | | | | |
| 19 | MEASURING | | | GMAW,  FCAW,  GTAW, &  GMAW |
| 20 | GMAW | | | GMAW |
| 21 | GMAW | | | GMAW |
| 22 | GMAW | | | GMAW |
| 23 | GMAW | | | GMAW |
| 24 | GMAW | | | GMAW |
| 25 | GMAW | | | GMAW |
| 26 | THERMAL CUTTING PROCESSES | | | GMAW,  FCAW,  GTAW, &  GMAW |
| 27 | THERMAL CUTTING PROCESSES | | | GMAW,  FCAW,  GTAW, &  GMAW |
| 28 | THERMAL CUTTING PROCESSES | | | GMAW,  FCAW,  GTAW, &  GMAW |
| 29 | THERMAL CUTTING PROCESSES | | | GMAW,  FCAW,  GTAW, &  GMAW |
| 30 | INSPECTION |  |  | GMAW,  FCAW,  GTAW, &  GMAW |
| 31 | INSPECTION |  |  | GMAW,  FCAW,  GTAW, &  GMAW |
| 32 | INSPECTION |  |  | GMAW,  FCAW,  GTAW, &  GMAW |
| 33 | JOINTS |  |  | GMAW,  FCAW,  GTAW, &  GMAW |
| 34 | CODES |  |  | GMAW,  FCAW,  GTAW, &  GMAW |
| 35 | MACHINERY |  |  | GMAW,  FCAW,  GTAW, &  GMAW |
| 36 | MACHINERY |  |  | GMAW,  FCAW,  GTAW, &  GMAW |
|  | |  | Semester Exams | |

## Welding & Metal Fabrication

**Senior Level Program**

|  |  |  |
| --- | --- | --- |
| Week | Technical Content | Course  Name/Outcome |
| 1 | ORIENTATION/PRE-TESTING |  |
| 2 | SAFETY | GMAW, FCAW,  GTAW, &  GMAW |
| 3 | GTAW | GTAW |
| 4 | GTAW | GTAW |
| 5 | GTAW | GTAW |
| 6 | GTAW | GTAW |
| 7 | GTAW | GTAW |
| 8 | GTAW | GTAW |
| 9 | WELDING SYMBOLS | GMAW, FCAW,  GTAW, &  GMAW |
| 10 | WELDING SYMBOLS | GMAW, FCAW,  GTAW, &  GMAW |
| 11 | WELDING SYMBOLS | GMAW, FCAW,  GTAW, &  GMAW |
| 12 | WELDING SYMBOLS | GMAW, FCAW,  GTAW, &  GMAW |
| 13 | FCAW | FCAW |
| 14 | FCAW | FCAW |
| 15 | FCAW | FCAW |
| 16 | FCAW | FCAW |
| 17 | TROUBLE SHOOTING | GMAW, FCAW,  GTAW, &  GMAW |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 18 | TROUBLE SHOOTING | |  | GMAW, FCAW,  GTAW, &  GMAW |
|  | | | Semester Exams | |
| 19 | METALURGY | |  | GMAW, FCAW,  GTAW, &  GMAW |
| 20 | METALURGY | |  | GMAW, FCAW,  GTAW, &  GMAW |
| 21 | METALURGY | |  | GMAW, FCAW,  GTAW, &  GMAW |
| 22 | METALURGY | |  | GMAW, FCAW,  GTAW, &  GMAW |
| 23 | ROBOTICS | |  | GMAW |
| 24 | ROBOTICS | |  | GMAW |
| 25 | ROBOTICS | |  | GMAW, |
| 26 | FABRICATION | |  | GMAW, FCAW,  GTAW, &  GMAW |
| 27 | FABRICATION | |  | GMAW, FCAW,  GTAW, &  GMAW |
| 28 | FABRICATION | |  | GMAW, FCAW,  GTAW, &  GMAW |
| 29 | FABRICATION | |  | GMAW, FCAW,  GTAW, &  GMAW |
| 30 | FABRICATION | |  | GMAW, FCAW,  GTAW, &  GMAW |
| 31 | FABRICATION | |  | GMAW, FCAW,  GTAW, &  GMAW |
| 32 | FABRICATION |  | | GMAW, FCAW,  GTAW, &  GMAW |
| 33 | FABRICATION |  | | GMAW, FCAW,  GTAW, &  GMAW |
| 34 | FABRICATION |  | | GMAW, FCAW,  GTAW, &  GMAW |
| 35 | ESTIMATING |  | | GMAW, FCAW,  GTAW, &  GMAW |
| 36 | ESTIMATING |  | |  |
|  |  | Semester Exams | |  |

**c. Basic Format of Instruction:**

Vanguard-Sentinel Career and Technology Centers enjoy the opportunity for students to apply their learned academics to the career field of their choice. A “typical” day includes program theory taught in a classroom setting, usually at the beginning of the period. Theoretical instruction includes the use of textbooks, multi-media, reading, writing, mathematical calculations, discussion, and real-life work situations.

Practical instruction usually follows theoretical instruction. In the laboratory students apply the theory learned in the classroom setting. This is accomplished through practical simulation in the laboratory using tools of their chosen trade, practical hands-on learning, project based learning, customer service, and worksites off campus when appropriate.

Instruction also takes place through partnerships with business and industry. Throughout the academic year qualified students are assigned to worksites for work placement exposure (mentorships, job shadowing, internships, clinicals, advanced placement). The placement may or may not be a paid experience.

**Two Pre-Apprenticeship OJT Employment Options:**

1. Students who meet the eligibility requirements may begin work the summer before their Platinum year and continue to work full time during the course of the Platinum year. This option is for those students who have met all of their academic requirements or are meeting them outside the normal school day.
2. Students who meet the eligibility requirements may begin work the summer before their Platinum year. Upon the beginning of the Platinum year students may work half day and return to their home/partner school the other half.
3. **Evaluation Methodology:**

Selection as defined by the Ohio Department of Education and VanguardSentinel Career & Technology Centers’ advisory boards for the purpose for industry credentialing.

Skill assessment tools:

* + AWS
  + NIMS
  + NCCER Level 1 Core
  + OSHA
  + CPR First Aid
  + FANUC Robotics
  + Motoman Robotics

1. **Structured Work Experience**

Level one (first year) – Students have the opportunity to be exposed to occupations and occupational settings in their career area by participating in unpaid experiences with business and industry partners. Mentorships, job-shadowing, internships, and clinicals comprise these unpaid experiences.

Level two (second year) – Upon completion of Level one, qualifying students may begin work for pay during the summer before the beginning of Level two. During the second semester of level two qualifying students may work in a career field related to their program of study instead of attending the career center. Students are paid and report to the worksite four days per week. Several programs offer non-paid experiences to their second year students such as clinicals and internships.

Paid work experiences are in compliance with State and Federal Labor Laws.

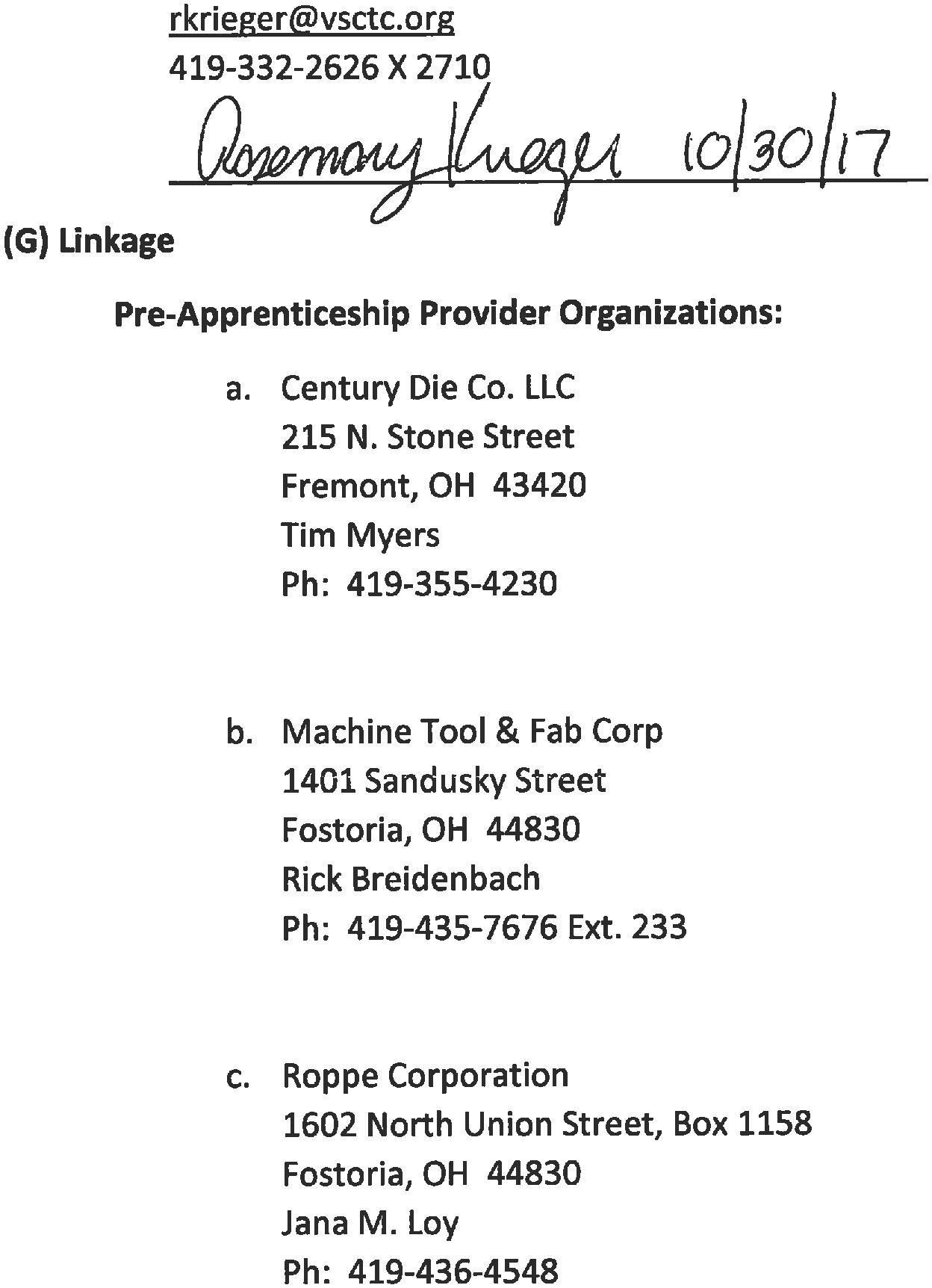
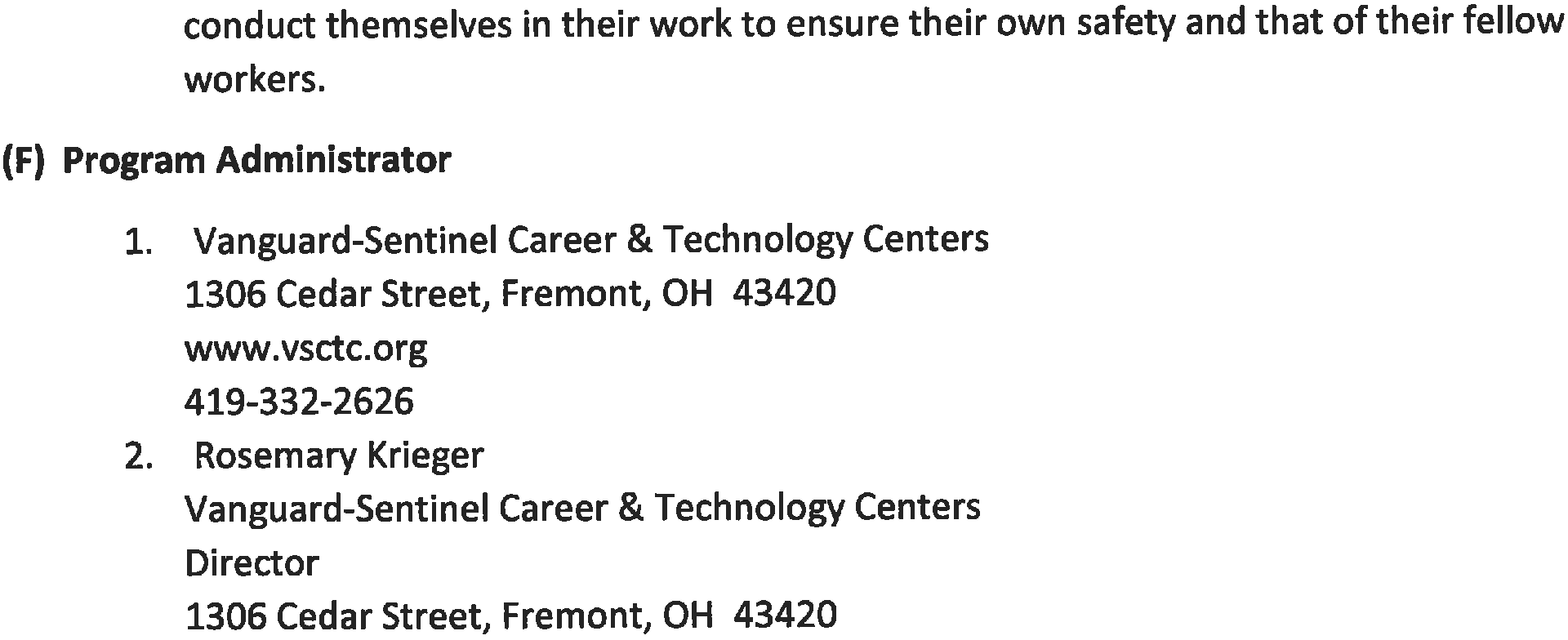
1. All youth program curriculum is approved by the Vanguard-Sentinel Career and Technology Centers Board of Education and aligned with the Ohio Department of Education.

1. All adult programs are developed with the University System of Ohio curriculum standards
2. **Participant Status**
   1. Information on each participant:

Application, status, skill level and all other information obtained by the student before, during, and after exiting from the program will be kept in a student file aby the Vanguard-Sentinel Career and Technology Center apprenticeship personnel.

* 1. Student will receive written notice of suspension or cancellation; those who complete the program will receive a certificate of completion.
  2. Retain documentation and records in school database and filing system.

1. **Safety and Welfare** 
   1. All trainees will receive instruction in safety and healthful work practices both on the job and in related instruction that are in compliance with the Occupational Safety and Health Administration (OSHA) Standards promulgated by the Secretary of Labor under 29 U.S.C. 651 et seq., as amended, dated December 29, 1970, and subsequent amendments to that law, or State Standards that have been found to be at least as effective as the Federal Standards.
   2. Trainees will be taught and trained that accident prevention is very largely a matter of education, vigilance, and cooperation and that they should strive at all times to



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Vanguard-Sentinel Career & Technology Centers

51

