

STATEWIDE ARTICULATION AGREEMENT

Industry Certification to AAS/AS Degree

A presentation to the Office of Articulation and the Articulation Coordinating Committee

➤ BACKGROUND INFORMATION

- Florida Advanced Technological Education Center for Manufacturing (FLATE) is a National Science Foundation (NSF) funded Regional Center which supports technical programs, curriculum development best practices, student involvement, and outreach activities to meet the workforce needs of the manufacturing related sectors within the state.
- A survey conducted by this group in late 2005 revealed Florida manufactures needed/wanted a manufacturing program taught at the Community College level, which was consistent across the State and met their diverse needs.
- A committee made up of the Florida Department of Education's Workforce Division, and representatives of FLATE, Florida Community Colleges, and Florida industries recently completed the development of a new AS/AAS degree program in Engineering Technology (ET) with five specialization tracts and nine specialization certificates. (**Handout #1**)
- The core curriculum for this degree (Engineering Technology Support Specialist – CCC) aligns with the Manufacturing Skills Standards Council's (MSSC) "Production Technician Certification". (**Handout #2**)

➤ MANUFACTURING SKILLS STANDARDS COUNCIL (MSSC)

- An industry-led training, assessment and certification system focused on the *core* skills and knowledge needed by the nation's production workers.
- A system, based upon federally-endorsed national standards, offers both entry-level and incumbent workers the opportunity to demonstrate they have mastered the skills increasingly needed in the high-growth, technology-intensive jobs of the 21st century.
- The "***Certified Production Technician (CPT)***" credential is awarded to individuals who pass all of the four Production modules: Safety; Quality Practices & Measurement; Manufacturing Processes & Production; and Maintenance Awareness.
- Applicable to all sectors of manufacturing.
- The federal National Skill Standards Board formally recognized MSSC and officially endorsed the MSSC's industry-led, nationally validated standards in 2001.

➤ “*Certified Production Technician (CPT)*” ASSESSMENT

- MSSC offers four assessments, which, collectively, cover the critical work functions involved in production. These four areas are common to all of Florida’s diverse manufacturing sectors. They are:

Safety

Quality Practices and Measurements

Manufacturing Processes and Production

Maintenance Awareness

Each assessment contains approximately 125 questions and takes 90 – 120 minutes to complete. **(Handout #3)**

- Assessments are delivered on-line in MSSC-certified Assessment Centers and include both multiple choice questions and computer simulations. MSSC provides test scores as soon as the assessment is completed showing whether an individual met the cut scores for passing. An individual may take an assessment as many times as desired, but with a minimum of thirty days between assessments.
- There are currently twelve MSSC-certified Assessment Centers in Florida:
 - Broward Community College
 - Central Florida Community College
 - Florida Community College at Jacksonville
 - Hillsborough Community College
 - Manatee Community College
 - Manatee Technical Institute – School District of Manatee County
 - Mid-Florida Tech – Orange County Public Schools
 - Pasco-Hernando Community College
 - Pinellas Technical Center
 - Polk Community College
 - Tallahassee Community College
 - Treasure Coast High School – St. Lucie County Public Schools

➤ PROPOSED STATEWIDE ARTICULATION AGREEMENT

- “Certified Production Technician” to Engineering Technology Degree Articulation Agreement **(Handout #4)**
- Standard admission policies required
- Validation Mechanisms: Credit held in escrow pending successful completion of nine (9) credit hours in the program core/electives with at least one course in the Engineering Technology Support Specialist program core.
- The common core of the Engineering Technology degree consists of technical core courses bundled as an 18 credit hour College Credit Certificate (Engineering Technology Support Specialist, CIP Number: 0615.061304) from the following areas:
 1. Instrumentation and measurement (3 credit hours)
 2. Manufacturing processes and materials (3 credit hours)
 3. Quality (3 credit hours)
 4. Electronics (3 credit hours)

5. Safety (3 credit hours)
6. Computer-aided drafting (3 credit hours)

The industry certification shall provide credit for the college's course in areas 1-5 of this common core. Area 6, Computer-aided drafting, is not included in the articulation as these competencies are not adequately verified by the certification.

(Handout #5)

- Community college faculty representing St. Petersburg College, Central Florida Community College, Brevard Community College and Pensacola Junior College agreed that the "Production Technician Certification" credential from the Manufacturing Skills Standards Council shall articulate fifteen (15) college credit hours to the AAS/AS Degree in Engineering Technology. **(Handout #6)**
- This proposal provides for the awarding of 15 college credit hours of the E.T. Technical Core to any holder of the certification whether they are Career Academy graduates, Technical School graduates, or incumbent workers.
- This agreement does not preclude but encourages the awarding of additional credits by any college through local agreements.

Handouts

Engineering Technology -- AAS/AS Degree

Engineering Technology Support Specialist (CORE)

The following programs are specialization areas for the Engineering Technology AAS/AS program:

Advanced Manufacturing Specialization

CCC - Automation

CCC - Lean Manufacturing

CCC - Pneumatics, Hydraulics & Motors For Manufacturing

Quality Specialization

CCC - Lean Six Sigma Green Belt Certificate

CCC - Six Sigma Black Belt Certificate

Mechanical Design & Fabrication Specialization

CCC - CNC Machinist

CCC - Computerized Woodworking

Electronics Specialization

CCC - Electronics Aide

Advanced Technology Specialization

CCC - Applied Technology Specialist

Handout #2

(19 pages)

#1

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC - Production

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards**P1 – Produce product to meet customer needs (MPPD2, QA6).**

Key Activities

- Identify customer needs.
- Determine that resources such as materials tools and equipment are available for the production process.
- Set up equipment for the production process.
- Perform and monitor the process to make the product.
- Inspect the product to make sure it meets specifications.
- Document product and process compliance with customer requirements.
- Prepare final product for shipping or distribution.

01. Industrial Processes:01.01, 01.02, 01.04, 01.05, 01.07, 01.08, 01.09,
01.10, 01.11, 01.12, 01.1306. Tools, Instruments, and Testing:06.01, 06.02, 06.03, 06.05, 06.07, 06.08, 06.09,
06.1007. Troubleshooting:

07.08, 07.03

08. Communication:

08.02

P2 – Maintain equipment, tools and workstations (MIR7).

Key Activities

- Perform preventive maintenance and routine repair.
- Monitor equipment to ensure it is operating correctly.
- Provide training to maintain equipment.
- Perform all housekeeping to maintain production schedule.

04. Safety:

04.07, 04.13,

06. Tools, Instruments, and Testing:

06.07, 06.01,

07. Troubleshooting:

07.02, 07.06, 07.10

P3 - Maintain a safe and productive work area (MPPD3, QA7, HSE8, MIR8).

Key Activities

- Perform environmental and safety inspections.
- Perform emergency drills and participate in emergency response teams.
- Identify unsafe conditions and take corrective action.
- Provide safety orientation to other employees.

01. Industrial Processes:

01.13, 01.12

06. Tools, Instruments, and Testing:

06.07

REFERENCES:

Manufacturing Skill Standard Council (MSSC) Core Knowledge and Skills (2005)

Florida Department of Education Curriculum Frameworks (2007)

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#1

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC - Production

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards**P4 – Maintain quality and implement continuous improvement processes (MPPD4, QA8).**

Key Activities

- Perform periodic internal quality audit activities.
- Check calibration of gauges and other data collection equipment.
- Suggest continuous improvements.
- Inspect materials at all states of process to determine quality or condition.
- Document the results of quality tests.
- Make adjustments to restore or maintain quality.

01. Industrial Processes:01.01, 01.02, 01.04, 01.05, 01.06, 01.07, 01.08,
01.09, 01.10, 01.11, 01.12, 01.1306. Tools, Instruments, and Testing:

06.03

08.Communication:

08.01, 08.02

P5 – Communicate with co-workers and/or external customers to ensure production meets business requirements (MPPD5, QA9).

Key Activities

- Communicate safety training and job specific needs.
- Communicate material specifications and delivery schedules.
- Communicate quality requirements issues and training.
- Communicate production requirements and product specifications.

01. Industrial Processes:01.01, 01.02, 01.04, 01.07, 01.08, 01.09, 01.09,
01.11, 01.1208.Communication:

08.01, 08.03, 08.04, 08.05, 08.06, 08.07, 08.08

P6 – Coordinate work team to produce product.

Key Activities

- Provide training to other employees.
- Set team goals.
- Make job assignments.
- Coordinate work flow with team members and other work groups.

05. Quality Assurance:

05.04, 05.11, 05.12, 05.13, 05.15, 05.16

06. Tools, Instruments, and Testing:

06.06

08. Communication:

08.01-08.08

10. Modern Business Practices & Strategies

10.05, 10.06

11. Employability Skills:

11.01, 11.04, 11.03, 11.06

REFERENCES:

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#1

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC - Production

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

P7 – Ensure safe use of equipment in the workplace (MIR4, HSE9).

Key Activities

- Train others to use equipment safely.
- Suggest process and procedures that support safety and effectiveness of work environment.
- Fulfill safety and health requirements for maintenance, installation and repair.
- Monitor equipment and operator performance.

01. Industrial Processes:

01.02, 01.03, 01.09

04. Safety:

04.01, 04.02, 04.04, 04.05, 04.18, 04.19, 04.10, 04.06

06. Tools, Instruments, and Testing:

06.01, 06.02

P8 - Correct the product and process to meet quality standards (QA3).

Key Activities

- Communicate quality problems.
- Suggest or perform corrective actions to correct quality problems.
- Determine appropriate action for sub-standard product.
- Record process outcomes and trends.
- Identify and report performance and training issues affecting quality.
- Implement closed-loop corrective action.

05. Quality Assurance:

05.05, 05.11, 05.13

06. Tools, Instruments, and Testing:

06.05, 06.03

11. Employability Skills:

11.06

**Florida Department of Education
Curriculum Framework
STUDENT PERFORMANCE STANDARDS – Full Titles**

| | |
|--|---|
| 01.0 - Demonstrate Knowledge Of Industrial Processes And Materials Properties | 07.0 - Demonstrate Basic Troubleshooting Skills |
| 02.0 - Generate And Interpret Computer-Aided Drawings | 08.0 - Demonstrate Appropriate Communication Skills |
| 03.0 - Demonstrate A Fundamental Understanding Of Electronics And Electricity | 09.0 - Demonstrate Appropriate Math Skills |
| 04.0 - Demonstrate An Understanding Of Safety, Health, And Environmental Requirements | 10.0 - Demonstrate An Understanding Of Modern Business Practices And Strategies |
| 05.0 - Demonstrate Proficiency In Use Of Quality Assurance Methods, Quality Control Concepts | 11.0 - Demonstrate Employability Skills |
| 06.0 - Demonstrate Proficiency In Using Tools, Instruments And Testing Devices | |

REFERENCES:

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#1

Mapping
MSSC Skills – FL DOE Curriculum Frameworks



MSSC - Production

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

REFERENCES:

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#2

Mapping MSSC Skills – FL DOE Curriculum Frameworks



| MSSC - Manufacturing Production Process Development | FL DOE – Curriculum Frameworks |
|--|---|
| Critical Work Function – Key Activities = (Duplicated in other Concentration Areas) | CIP Number: 0615.061304 Student Performance Standards |
| MPPD1 – Improve production processes. | |
| Key Activities <ul style="list-style-type: none"> ▪ Conduct research for new products. ▪ Propose changes to improve products and processes. ▪ Develop production improvement goals. ▪ Inspect product for deviations from customer and product standard(s). ▪ Correct product or process problems. | <u>01. Industrial Processes:</u> 01.01, 01.02, 01.04, 01.05, 01.06, 01.07, 01.08, 01.09, 01.10, 01.11, 01.12, 01.13 <u>07. Troubleshooting:</u> 07.02, 07.03, 07.08 <u>08. Communication:</u> 08.01, 08.02 |
| MPPD2 – Produce product to meet customer needs (QA6). | |
| Key Activities <ul style="list-style-type: none"> ▪ Identify customer needs. ▪ Determine that resources such as materials tools and equipment are available for the production process. ▪ Set up equipment for the production process. ▪ Perform and monitor the process to make the product. ▪ Inspect the product to make sure it meets specifications. ▪ Document product and process compliance with customer requirements. ▪ Prepare final product for shipping or distribution. | <u>01. Industrial Processes:</u> 01.01, 01.02, 01.04, 01.05, 01.07, 01.08, 01.09, 01.10, 01.11, 01.12, 01.13 <u>06. Tools, Instruments, and Testing:</u> 06.01, 06.02, 06.03, 06.05, 06.07, 06.08, 06.09, 06.10 <u>07. Troubleshooting:</u> 07.08, 07.03 <u>08. Communication:</u> 08.02 |
| MPPD3 - Maintain a safe and productive work area (QA7, HSE8, MIR8). | |
| Key Activities <ul style="list-style-type: none"> ▪ Perform environmental and safety inspections. ▪ Perform emergency drills and participate in emergency response teams. ▪ Identify unsafe conditions and take corrective action. ▪ Provide safety orientation to other employees. | <u>01. Industrial Processes:</u> 01.13, 01.12 <u>06. Tools, Instruments, and Testing:</u> 06.07 |

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#2

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC - Manufacturing Production Process Development

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

MPPD4 – Maintain quality and implement continuous improvement processes (QA8).

Key Activities

- Conduct periodic internal quality audit activities.
- Check calibration of gauges and other data collection equipment.
- Suggest continuous improvements.
- Inspect materials at all states of process to determine quality or condition.
- Document the results of quality tests.
- Make adjustments to restore or maintain quality.

01. Industrial Processes:

01.01, 01.02, 01.04, 01.05, 01.06, 01.07, 01.08, 01.09, 01.10, 01.11, 01.12, 01.13

06. Tools, Instruments, and Testing:

06.03

08.Communication:

08.01, 08.02

MPPD5 – Communicate with co-workers and/or external customers to ensure production meets business requirements (QA9).

Key Activities

- Communicate safety training and job specific needs.
- Communicate material specifications and delivery schedules.
- Communicate quality requirements issues and training.
- Communicate production requirements and product specifications.

01. Industrial Processes:

01.01, 01.02, 01.04, 01.07, 01.08, 01.09, 01.09, 01.11, 01.12

08.Communication:

08.01, 08.03, 08.04, 08.05, 08.06, 08.07, 08.08

MPPD6 – Suggest and/or implement continuous improvement actions (QA4).

Key Activities

- Analyze data to identify potential problems.
- Monitor process capability.
- Monitor customer satisfaction.
- Measure and record product and process outcomes.
- Participate in making new work procedures.
- Implement approved recommendations.
- Check that final product meets customer and business needs.

01. Industrial Processes:

01.01, 01.02, 01.03, 01.04, 01.06, 01.07, 01.08, 01.10, 01.11, 01.13

06. Tools, Instruments, and Testing:

06.03, 06.05

07. Troubleshooting:

07.01, 07.03, 07.09

08.Communication:

08.01, 08.02, 08.03, 08.04, 08.04, 08.05, 08.06, 08.07, 08.08

10.0 Modern Business Practices/Strategies

10.06

REFERENCES:

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Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC - Manufacturing Production Process Development

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

MPPD7 – Produce new product to meet customer needs.

Key Activities

- Conduct research for new products.
- Obtain required supplies.
- Execute process to produce new product.
- Inspect product for deviations from specifications.
- Evaluate prototypes for manufacturability.
- Solve production process problems.
- Deliver finished product to next stage in production process.

01. Industrial Processes:

01.01, 01.02, 01.04, 01.05, 01.06, 01.07, 01.08, 01.09, 01.10, 01.11, 01.12

06. Tools, Instruments, and Testing:

06.06

07. Troubleshooting:

07.01, 07.02

08. Communication:

08.01, 08.02, 08.03, 08.04, 08.04, 08.05, 08.06, 08.07, 08.08

MPPD8 – Implement new manufacturing processes.

Key Activities

- Research the new manufacturing process.
- Create standard operating procedures (SOPs) for new processes.
- Develop new tooling and fixtures.
- Set up and program equipment for new processes.
- Schedule and test new processes.
- Monitor production performance data for new processes.
- Train employees on new processes.
- Prepare documentation on new processes.

01. Industrial Processes:

01.01.01.01, 01.02, 01.03, 01.04, 01.05, 01.06, 01.07, 01.08, 01.09, 01.10, 01.11, 01.12, 01.13

06. Tools, Instruments, and Testing:

06.01, 06.02, 06.05, 06.07

08. Communication:

08.01, 08.04, 08.04, 08.05, 08.06, 08.07, 08.08

10.0 Modern Business Practices/Strategies

10.03

11. Employability Skills:

11.01, 11.03

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Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC - Manufacturing Production Process Development

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

**Florida Department of Education
Curriculum Framework
STUDENT PERFORMANCE STANDARDS – Full Titles**

| | |
|--|---|
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| 04.0 - Demonstrate An Understanding Of Safety, Health, And Environmental Requirements | 10.0 - Demonstrate An Understanding Of Modern Business Practices And Strategies |
| 05.0 - Demonstrate Proficiency In Use Of Quality Assurance Methods, Quality Control Concepts | 11.0 - Demonstrate Employability Skills |
| 06.0 - Demonstrate Proficiency In Using Tools, Instruments And Testing Devices | |

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#3

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Quality Assurance

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

QA1 - Ensure materials meet quality specifications.

Key Activities

- Inspect materials against quality specifications.
- Report materials quality deviations to production.
- Release materials that meet specification to production.
- Maintain supplier relationships to ensure quality of materials.

04. Safety:

04.06

05. Quality Assurance:

05.04, 05.14, 05.18, 05.22

06. Tools, Instruments, and Testing:

06.01, 06.07, 06.05, 06.06, 06.10

08. Communication:

08.03, 08.04, 08.06

10. Modern Business Practices & Strategies

10.01, 10.02, 10.06

QA2 - Monitor production operations for product and process quality.

Key Activities

- Track materials for quality throughout production process.
- Check product sample for quality at each state of production.
- Check that final product meets quality specifications.
- Document quality results at each stage of production process.

05. Quality Assurance:

05.01, 05.08

06. Tools, Instruments, and Testing:

06.01, 06.02, 06.03

08. Communication:

08.02, 08.01, 08.06

11. Employability Skills:

11.06

QA3 - Correct the product and process to meet quality standards.

Key Activities

- Communicate quality problems.
- Suggest or perform corrective actions to correct quality problems.
- Determine appropriate action for sub-standard product.
- Record process outcomes and trends.
- Identify and report performance and training issues affecting quality.
- Implement closed-loop corrective action.

05. Quality Assurance:

05.05, 05.11, 05.13

06. Tools, Instruments, and Testing:

06.05, 06.03

11. Employability Skills:

11.06

REFERENCES:

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Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Quality Assurance

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

QA4 - Suggest and/or implement continuous improvement actions (MPPD6).

Key Activities

- Analyze data to identify potential problems.
- Monitor process capability.
- Monitor customer satisfaction.
- Measure and record product and process outcomes.
- Participate in making new work procedures.
- Implement approved recommendations.
- Check that final product meets customer and business needs.

05. Quality Assurance:

05.01, 05.05, 05.06, 05.08, 05.09, 05.10, 05.11

06. Tools, Instruments, and Testing:

06.03, 06.05

08. Communication:

08.01, 08.07, 08.05, 08.01, 08.08

11. Employability Skills:

11.01, 11.03

QA5 - Coordinate work team to facilitate quality assurance.

Key Activities

- Provide training to other employees.
- Participate in meeting and problem solving groups.
- Coordinate work flow with team members and other work groups.
- Promote career development.
- Maintain personal certification and licensure.

05. Quality Assurance:

05.04, 05.11, 05.12, 05.13, 05.15, 05.16

06. Tools, Instruments, and Testing:

06.06

08. Communication:

08.01-08.08

10. Modern Business Practices & Strategies

10.05, 10.06

11. Employability Skills:

11.01, 11.04, 11.03, 11.06

QA6 - Produce product to meet customer needs (MPPD2).

Key Activities

- Identify customer needs.
- Determine that resources such as material and equipment are available for the production process.
- Set up equipment for the production process.
- Perform the process to make the product.
- Inspect the product to make sure it meets specifications.
- Document product and process compliance with customer requirements.

05. Quality Assurance:

05.02, 05.03, 05.17, 05.19

06. Tools, Instruments, and Testing:

06.01, 06.02, 06.10, 06.07

07. Troubleshooting:

07.03

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Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Quality Assurance

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

- Document product and process compliance with customer requirements.
- Prepare final product for shipping or distribution.

QA7 - Maintain a safe and productive work area (MPPD3, HSE8, MIR8).

Key Activities

- Perform environmental and safety inspections.
- Perform emergency drills and participate in emergency response teams.
- Identify unsafe conditions and take corrective action.
- Provide safety orientation to other employees.

05. Quality Assurance:

05.18

06. Tools, Instruments, and Testing:

06.03

QA8 - Maintain quality and implement continuous improvement processes (MPPD4).

Key Activities

- Perform periodic internal quality audit activities.
- Check calibration of gauges and other data collection equipment.
- Suggest continuous improvements.
- Inspect materials at all stages of process to determine quality or condition.
- Document the results of quality tests.
- Make adjustments to restore or maintain quality.

05. Quality Assurance:

05.08, 05.13, 05.19, 05.20

06. Tools, Instruments, and Testing:

06.09

08. Communication:

08.01, 08.02, 08.03, 08.04, 08.07, 08.08

QA9 - Communicate with co-workers and/or external customers to ensure production meets business requirements (MPPD5).

Key Activities

- Communicate safety, training, and job specific needs.
- Communicate material specifications and delivery schedules.
- Communicate quality requirements, issues, and training.
- Communicate production requirements and product specifications.

05. Quality Assurance:

05.07

08. Communication:

08.01, 08.02, 08.03, 08.04, 08.05, 08.06, 08.07,

08.08

REFERENCES:

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Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Quality Assurance

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

**Florida Department of Education
Curriculum Framework
STUDENT PERFORMANCE STANDARDS – Full Titles**

| | |
|--|---|
| 01.0 - Demonstrate Knowledge Of Industrial Processes And Materials Properties | 07.0 - Demonstrate Basic Troubleshooting Skills |
| 02.0 - Generate And Interpret Computer-Aided Drawings | 08.0 - Demonstrate Appropriate Communication Skills |
| 03.0 - Demonstrate A Fundamental Understanding Of Electronics And Electricity | 09.0 - Demonstrate Appropriate Math Skills |
| 04.0 - Demonstrate An Understanding Of Safety, Health, And Environmental Requirements | 10.0 - Demonstrate An Understanding Of Modern Business Practices And Strategies |
| 05.0 - Demonstrate Proficiency In Use Of Quality Assurance Methods, Quality Control Concepts | 11.0 - Demonstrate Employability Skills |
| 06.0 - Demonstrate Proficiency In Using Tools, Instruments And Testing Devices | |

REFERENCES:

Manufacturing Skill Standard Council (MSSC) Core Knowledge and Skills (2005)
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#3

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Quality Assurance

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

QA1 - Ensure materials meet quality specifications.

Key Activities

- Inspect materials against quality specifications.
- Report materials quality deviations to production.
- Release materials that meet specification to production.
- Maintain supplier relationships to ensure quality of materials.

04. Safety:

04.06

05. Quality Assurance:

05.04, 05.14, 05.18, 05.22

06. Tools, Instruments, and Testing:

06.01, 06.07, 06.05, 06.06, 06.10

08. Communication:

08.03, 08.04, 08.06

10. Modern Business Practices & Strategies

10.01, 10.02, 10.06

QA2 - Monitor production operations for product and process quality.

Key Activities

- Track materials for quality throughout production process.
- Check product sample for quality at each state of production.
- Check that final product meets quality specifications.
- Document quality results at each stage of production process.

05. Quality Assurance:

05.01, 05.08

06. Tools, Instruments, and Testing:

06.01, 06.02, 06.03

08. Communication:

08.02, 08.01, 08.06

11. Employability Skills:

11.06

QA3 - Correct the product and process to meet quality standards.

Key Activities

- Communicate quality problems.
- Suggest or perform corrective actions to correct quality problems.
- Determine appropriate action for sub-standard product.
- Record process outcomes and trends.
- Identify and report performance and training issues affecting quality.
- Implement closed-loop corrective action.

05. Quality Assurance:

05.05, 05.11, 05.13

06. Tools, Instruments, and Testing:

06.05, 06.03

11. Employability Skills:

11.06

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MSSC – Quality Assurance

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

QA4 - Suggest and/or implement continuous improvement actions (MPPD6).

Key Activities

- Analyze data to identify potential problems.
- Monitor process capability.
- Monitor customer satisfaction.
- Measure and record product and process outcomes.
- Participate in making new work procedures.
- Implement approved recommendations.
- Check that final product meets customer and business needs.

05. Quality Assurance:

05.01, 05.05, 05.06, 05.08, 05.09, 05.10, 05.11

06. Tools, Instruments, and Testing:

06.03, 06.05

08. Communication:

08.01, 08.07, 08.05, 08.01, 08.08

11. Employability Skills:

11.01, 11.03

QA5 - Coordinate work team to facilitate quality assurance.

Key Activities

- Provide training to other employees.
- Participate in meeting and problem solving groups.
- Coordinate work flow with team members and other work groups.
- Promote career development.
- Maintain personal certification and licensure.

05. Quality Assurance:

05.04, 05.11, 05.12, 05.13, 05.15, 05.16

06. Tools, Instruments, and Testing:

06.06

08. Communication:

08.01-08.08

10. Modern Business Practices & Strategies

10.05, 10.06

11. Employability Skills:

11.01, 11.04, 11.03, 11.06

QA6 - Produce product to meet customer needs (MPPD2).

Key Activities

- Identify customer needs.
- Determine that resources such as material and equipment are available for the production process.
- Set up equipment for the production process.
- Perform the process to make the product.
- Inspect the product to make sure it meets specifications.
- Document product and process compliance with customer requirements.

05. Quality Assurance:

05.02, 05.03, 05.17, 05.19

06. Tools, Instruments, and Testing:

06.01, 06.02, 06.10, 06.07

07. Troubleshooting:

07.03

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Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Quality Assurance

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

- Document product and process compliance with customer requirements.
- Prepare final product for shipping or distribution.

QA7 - Maintain a safe and productive work area (MPPD3, HSE8, MIR8).

Key Activities

- Perform environmental and safety inspections.
- Perform emergency drills and participate in emergency response teams.
- Identify unsafe conditions and take corrective action.
- Provide safety orientation to other employees.

05. Quality Assurance:

05.18

06. Tools, Instruments, and Testing:

06.03

QA8 - Maintain quality and implement continuous improvement processes (MPPD4).

Key Activities

- Perform periodic internal quality audit activities.
- Check calibration of gauges and other data collection equipment.
- Suggest continuous improvements.
- Inspect materials at all stages of process to determine quality or condition.
- Document the results of quality tests.
- Make adjustments to restore or maintain quality.

05. Quality Assurance:

05.08, 05.13, 05.19, 05.20

06. Tools, Instruments, and Testing:

06.09

08. Communication:

08.01, 08.02, 08.03, 08.04, 08.07, 08.08

QA9 - Communicate with co-workers and/or external customers to ensure production meets business requirements (MPPD5).

Key Activities

- Communicate safety, training, and job specific needs.
- Communicate material specifications and delivery schedules.
- Communicate quality requirements, issues, and training.
- Communicate production requirements and product specifications.

05. Quality Assurance:

05.07

08. Communication:

08.01, 08.02, 08.03, 08.04, 08.05, 08.06, 08.07, 08.08

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Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Quality Assurance

FL DOE – Curriculum Frameworks

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#4

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Health, Safety, and Environmental Assurance

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

HSE1 –Train workers in health, safety, and/or environmental issues.

Key Activities

- Determine priorities for health, safety, and/or environmental training needs.
- Prepare health, safety, and/or environmental training materials.
- Conduct health, safety, and/or environmental training for employees.
- Document required health, safety, and/or environmental training.
- Plan future health, safety, and/or environmental training.

04. Safety, Health, and Environmental:
04.01, 04.02

HSE2 –Conduct health, safety, and/or environmental incident and hazard investigations.

Key Activities

- Investigate health, safety, and environmental incidents.
- Investigate health, safety, and/or environmental hazards.
- Document findings of health, safety, and/or environmental investigations.
- Suggest corrective actions.
- Check that appropriate action has been taken to correct health, safety, and/or environmental problems.

04. Safety, Health, and Environmental:
04.15
06. Tools, Instruments, and Testing:
06.07

HSE3 - Conduct preventive health, safety, and environmental inspections.

Key Activities

- Check safety, health, and/or environmental inspections.
- Document inspection findings.
- Conduct area health, safety, and environmental inspections.
- Submit inspection and audit findings to correct parties.
- Regularly check job safety analysis against actual experience.

04. Safety, Health, and Environmental:
04.09
06. Tools, Instruments, and Testing:
06.09
08. Communication:
08.04, 08.07

HSE4 –Implement health, safety, and/or environmental programs, projects, policies or procedures.

Key Activities

- Document regulatory compliance.
- Communicate company health, safety, and environmental policies and procedures.
- Stop unsafe work practices.
- Suggest solutions that will eliminate unsafe practices.
- Report violations to appropriate authorities.
- Prepare for health, safety, and/or environmental emergencies.

04. Safety, Health, and Environmental:
04.10, 04.17, 04.19
06. Tools, Instruments, and Testing:
06.04, 06.07
07. Troubleshooting:
07.03
08. Communication:
08.01, 08.06, 08.07

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#4

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Health, Safety, and Environmental Assurance

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

HSE5 –Implement continuous improvement in health, safety, and/or environmental assurance practices.

Key Activities

- Analyze root causes or problems and prioritize which problems need to be addressed first.
- Analyze health, safety, and environmental data.
- Determine projects to address priorities.
- Benchmark health, safety, and environmental practices.
- Maintain knowledge of policies and procedures for health, safety, and/or environmental issues.

04. Safety, Health, and Environmental:
04.11
08. Communication:
08.02

HSE6 –Promote health, safety, and/or environmental assurance programs.

Key Activities

- Advocate for workplace safety.
- Suggest health, safety, and/or environmental assurance programs to management and other workers.
- Evaluate health, safety, and/or environmental programs.
- Educate others about the benefits of workplace health, safety, and/or environmental assurance programs.

04. Safety, Health, and Environmental:
04.05, 04.18
08. Communication:
08.03

HSE7 –Conduct job safety and health analysis for jobs, equipment and processes.

Key Activities

- Consult with outside sources about health, safety, and environmental assurance aspects of jobs.
- Participate in the development of job safety analysis.
- Gather information from employees about occupational hazards.
- Suggest ways to eliminate hazards.
- Regularly verify job safety analysis against experience.

04. Safety, Health, and Environmental:
04.14, 04.20

HSE8 –Maintain a safe and productive work area (MPPD3, QA7, MIR8).

Key Activities

- Perform environmental and safety inspections.
- Perform emergency drills and participate in emergency response teams.
- Identify unsafe conditions and take corrective actions.
- Provide safety orientation to other employees.

04. Safety, Health, and Environmental:
04.04, 04.12

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#4

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Health, Safety, and Environmental Assurance

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

HSE9 –Ensure safe use of equipment in the workplace (MIR4).

Key Activities

- Train others to use equipment safely.
- Suggest process and procedures that support safety and effectiveness of work environment.
- Fulfill safety and health requirements for maintenance installation and repair.
- Monitor equipment and operator performance.

04. Safety, Health, and Environmental:
04.03, 04.07, 04.13
08. Communication:
08.07

HSE10 –Plan for safety in new production processes.

Key Activities

- Report hazards and problems.
- Ensure adherence to policies and procedures.
- Take corrective action regarding safety policies and procedures.
- Document hazards and problems.
- Implement safety programs.

04. Safety, Health, and Environmental:
04.08
08. Communication:
08.07

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#5

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Maintenance, Installation, and Repair

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

MIR1 – Coordinate predictive and preventive maintenance to ensure that production process runs smoothly.

Key Activities

- Develop the maintenance schedule.
- Identify special maintenance and repair needs.
- Check on availability of workers and other resources.
- Perform predictive and preventive maintenance.
- Check that equipment is working prior to releasing the equipment to the operator.

01. Industrial Processes:

01.10, 01.13

04. Safety:

04.13

05. Quality:

05.01, 05.02, 05.06

06. Tools, Instruments, and Testing:

06.05, 06.09

07. Troubleshooting:

07.01, .07.02, 07.03, 07.04, 07.05, 07.06, 07.08

MIR2 – Communicate with others to ensure that maintenance and repairs meet business needs.

Key Activities

- Educate others about benefits of predictive and preventive maintenance.
- Consult with others to set repair and maintenance priorities and schedule.
- Communicate maintenance and repair resource needs.
- Prepare maintenance and repair logs for shift-to-shift communication.
- Suggest ways to prevent future equipment malfunctions.

01. Industrial Processes:

01.04, 01.07, 01.13

06. Tools, Instruments, and Testing:

06.03, 07.05, 07.10, 08.07

MIR3 - Maintain hands-on knowledge of equipment operation to identify maintenance needs.

Key Activities

- Observe equipment operation during normal operating cycle to identify potential problems.
- Maintain up-to-date knowledge of all documentation related to equipment.
- Maintain information about equipment use and reliability.
- Maintain all relevant equipment operation and repair certifications.
- Maintain personal certification and licensure.

01. Industrial Processes:

01.13

05. Quality:

05.01, 05.08, 05.09, 05.12, 05.10

07. Troubleshooting:

07.02, 07.06

11.07

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#5

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC – Maintenance, Installation, and Repair

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

MIR4 –Ensure safe use of equipment in the workplace (HSE9).

Key Activities

- Train others to use equipment safely.
- Suggest process and procedures that support safety and effectiveness of work environment.
- Fulfill safety and health requirements for maintenance, installation and repair.
- Monitor equipment and operator performance.

01. Industrial Processes:

01.02, 01.03, 01.09

04. Safety:

04.01, 04.02, 04.04, 04.05, 04.18, 04.19, 04.10, 04.06

06. Tools, Instruments, and Testing:

06.01, 06.02

MIR5 –Identify, diagnose and/or repair equipment problems.

Key Activities

- Gather equipment information and history to identify and/or diagnose problems.
- Follow procedures to isolate system and component failure.
- Identify root cause of problem.
- Develop corrective action plan to fix the problem.
- Execute corrective action plan.
- Document diagnosis, case history plan and repair outcome.

01. Industrial Processes:

01.02, 01.04

02. Interpret CAD:

02.14, 02.15

04. Safety:

04.04, 04.10, 04.13

05. Quality:

05.01, 05.23

06. Tools, Instruments, and Testing:

06.03, 06.05, 06.06, 06.09, 06.10

07. Troubleshooting 08. Communication:

09. Math Skills, 10.06, 11.06

MIR6 – Support the installation, customization or upgrading of equipment.

Key Activities

- Coordinate preparation for the installation, customization and upgrading of equipment.
- Obtain information from vendors to ensure proper installation, customization, or upgrade.
- Participate in the installation, customization or upgrading of equipment.
- Prepare installation, customization or upgrade team.
- Move or remove equipment.
- Test the equipment to ensure proper function after installation, customization or upgrading.

01. Industrial Processes:

01.01, 01.04, 01.12

05. Quality:

05.18

07. Troubleshooting:

07.02, 07.08, 07.10, 07.07, 07.10

08. Communication:

08.07, 08.03, 08.04, 11.06

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MSSC – Maintenance, Installation, and Repair

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Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

MIR7 – Maintain equipment, tools and workstations.

Key Activities

- Perform preventive maintenance and routine repair.
- Monitor equipment to ensure it is operating correctly.
- Provide training to maintain equipment.
- Perform all housekeeping to maintain production schedule.

04. Safety:

04.07, 04.13,

06. Tools, Instruments, and Testing:

06.07, 06.01,

07. Troubleshooting:

07.02, 07.06, 07.10

MIR8 – Maintain a safe and productive work area (MPPD3, QA7, HSE8).

Key Activities

- Perform environmental and safety inspections.
- Perform emergency drills and participate in emergency response teams.
- Identify unsafe conditions and take corrective action.
- Provide safety orientation to other employees.

04. Safety:

04.02, 04.08, 04.09, 04.20

05. Quality:

05.18

06. Tools, Instruments, and Testing:

06.03, 06.07

07. Troubleshooting:

07.(all)

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#6

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC - Logistics

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

LIC1 – Manage inventory to meet production requirements.

Key Activities

- Monitor location of materials during production process.
- Station materials for production flow.
- Document materials movement and inventory count.
- Establish lot sizes and reorder points.
- Conduct on-site inventory.
- Report discrepancies in inventory audit.
- Find causes of discrepancies in inventory audit.
- Change logistics processes and update inventory to respond to engineering changes.

01. Industrial Processes:

01.01, 01.02, 01.04, 01.05, 01.07, 01.12, 01.13

05.: Quality

05.02, 05.04, 05.11, 05.14, 05.15, 05.17, 05.18,
05.19, 05.20, 05.21, 05.22, 05.23

06. Tools, Instruments, and Testing:

06.03

10.0. Modern Business Practices & Strategies

10.06

LIC2 – Ship and receive products and materials.

Key Activities

- Check accuracy of order.
- Package and unpackage materials and products.
- Load and unload materials and products.
- Schedule transportation of products and material to meet customer needs.

01. Industrial Processes:

01.01, 01.07, 01.08, 01.11

04. Safety:

04.01, 04.02, 04.04, 04.05, 04.06, 04.10, 04.12,
04.13, 04.15, 04.19, 04.20

05. Quality:

05.01, 05.02, 05.05, 05.07, 05.08, 05.09, 05.10,
05.14, 05.15, 05.17, 05.18, 05.21, 05.22

10.0. Modern Business Practices & Strategies

10.02, 10.03, 10.06

LIC3 - Maintain a safe and productive work area (MPPD3, QA7, HSE8, MIR8).

Key Activities

- Perform environmental and safety inspections.
- Perform emergency drills and participate in emergency response teams.
- Identify unsafe conditions and take corrective action.
- Provide safety orientation to other employees.

01. Industrial Processes:

01.13, 01.12

04. Safety:

04.01, 04.02, 04.06, 04.20

06. Tools, Instruments, and Testing:

06.07

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#6

Mapping MSSC Skills – FL DOE Curriculum Frameworks



MSSC - Logistics

FL DOE – Curriculum Frameworks

Critical Work Function – Key Activities = (Duplicated in other Concentration Areas)

CIP Number: 0615.061304
Student Performance Standards

LIC4 – Communicate with co-workers and/or external customers to ensure production meets business requirements (MPPD5, QA9, P5).

Key Activities

- Communicate safety training and job specific needs.
- Communicate material specifications and delivery schedules.
- Communicate quality requirements issues and training.
- Communicate production requirements and product specifications.

01. Industrial Processes:

01.01, 01.02, 01.04, 01.07, 01.08, 01.09, 01.09, 01.11, 01.12

08. Communication:

08.01, 08.03, 08.04, 08.05, 08.06, 08.07, 08.08

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PRODUCTION TECHNICIAN CERTIFICATION

KNOWLEDGE AND SKILLS DEMONSTRATED IN ORDER TO ACHIEVE THE CERTIFICATION

SAFETY

Key Activities and Performance Indicators

1. Work in a Safe and Productive Manufacturing Workplace

- a. Ways in which manufacturing affects the national and global economies are recognized
- b. Systems of safety used by high-performance manufacturers to produce quality products at lowest possible costs are recognized
- c. Role of production workers in helping to ensure competitive levels of cost, quality and delivery in a safe work environment is identified
- d. External and internal customers are identified.

2. Perform safety and environmental inspections

- a. Potential hazards in the work are identified, reported and monitored
- b. Corrective action is taken to eliminate potential hazards
- c. Health, safety and environmental documentation and policies are thorough and regularly reviewed
- d. Inspections meet all relevant health, safety and environmental laws and regulations
- e. Inspections are performed according to company schedule and procedures
- f. Inspections are documented
- g. Inspection records are stored correctly.

3. Perform emergency drills and participate in emergency teams

- a. Training and certification on relevant emergency and first aid procedures are complete and up-to-date
- b. Procedures for responding to fire and electrical emergencies are clearly defined
- c. Emergency response complies with company and regulatory policies and procedures
- d. Emergency drills and incidents are documented promptly according to company and regulatory procedures

4. Identify unsafe conditions and take corrective action

- a. Conditions that present a threat to health, safety, and the environment are identified, reported, and documented properly
- b. Corrective actions are identified
- c. Appropriate parties are consulted about corrective action
- d. Corrective actions are taken promptly according to company procedures
- e. Ongoing safety concerns are tracked and reported until corrective action is taken

5. Provide safety orientation for all employees

- a. Orientation covers all topics and procedures needed to facilitate employee safety
- b. Orientation identifies needs and processes to raise safety concerns, ask questions, and receive additional training
- c. Orientation is provided on use of personal protective equipment

- d. Orientation is documented according to company requirements
- e. Orientation meets all relevant laws, policies and regulations
- f. Safety training is delivered regularly

6. Train personnel to use equipment safely

- a. New operators are given a complete orientation to the equipment and guidelines for ergonomic safety

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- b. All important information regarding equipment safety, including material handling equipment, is communicated clearly and effectively
- c. Suggestions regarding training materials and content are made to the correct parties
- d. Evaluations and feedback are utilized to improve training materials and methods
- e. During training, trainee has the correct tools to do the job
- f. Post-training evaluation indicates that workers can operate equipment safely
- g. Training and facilitation techniques used are appropriate for trainees
- h. Quality and effectiveness of training are documented appropriately

7. Suggest processes and procedures that support safety of work environment

- a. Health and safety representatives are consulted in the development of suggestions
- b. Operator feedback is solicited and used to create a safer, more effective work environment
- c. Suggestions are made to correct parties, according to company procedure
- d. Suggestions are properly documented
- e. Content of suggestions appropriately responds to safety, quality and productivity issues

8. Fulfill safety and health requirements for maintenance, installation, and repair

- a. Communication regarding safety is made regularly to all employees
- b. Job safety analyses are reviewed regularly according to company policy
- c. Hazardous materials procedures and policies, such as Material Safety Data Sheets (MSDS) and right-to-know, are accurately followed
- d. Environmental testing of workplace is performed on a regular basis as required by company policy and regulation
- e. Equipment is audited to ensure there are no by-passes of safety guards
- f. All regulatory and company safety procedures are followed, including those related to lock-out/tag-out, confined space, and ergonomics
- g. Good housekeeping procedures are followed

9. Monitor safe equipment and operator performance

- a. Monitoring is performed regularly
- b. Out-of-compliance or unsafe conditions are reported immediately
- c. Corrective action is taken on out-of-compliance or unsafe conditions
- d. Equipment is checked to ensure it is operating according to safety specifications
- e. Tools are checked to ensure they are in compliance with safety specifications
- f. Accident and injury data is forwarded to appropriate personnel for inclusion in OSHA recordables
- g. Information on equipment use is gathered from operators to reveal existing or potential safety problems.
- h. All safety monitoring data is accurately documented

10. Utilize effective, safety-enhancing workplace practices

- a. Communications are clear
- b. Teamwork is effective
- c. Production job assignments are made properly
- d. Training programs are run efficiently

Basic Technical Knowledge and Skills

Safe and Productive Workplace

1. Knowledge of ways in which manufacturing affects the national economy and standard of living
2. Knowledge of ways in which the global economy affects manufacturers
3. Knowledge of major sub-industries within manufacturing
4. Knowledge of common safety practices and systems
5. Knowledge of responsibilities of a frontline production worker in a high-performance, safety-conscious work organization
6. Skill in recognizing different and common needs of internal and external customers
7. Skill in maintaining customer contact about product specifications and printed specs to ensure understanding of needs, including those related to safety

Safety procedures

1. Knowledge of how to locate and use Material Safety Data Sheets (MSDS)
2. Knowledge of company first aid or first response procedures
3. Knowledge of material handling techniques to safely move materials
4. Knowledge of how to be proactive in responding to a safety concern and document occurrences
5. Knowledge of emergency exits
6. Knowledge of various emergency alarms and procedures
7. Knowledge of clean-up procedures for spills
8. Knowledge of Lock Out/Tag Out requirements
9. Knowledge of how to inspect work area and report possible safety risks
10. Knowledge of machinery and equipment safety functions to determine if all safeguards are operational
11. Knowledge of safety procedures in case of smoke or chemical inhalation
12. Knowledge of procedures for handling hazardous material
13. Skill in developing safety checklists
14. Knowledge of equipment shutdown procedures
15. Skill in performing leak checks to determine if toxic or hazardous material is escaping from a piece of equipment
16. Knowledge of proper and safe installation techniques as described in manuals, checklists, and regulations

Personal Safety Practices

1. Skill in identifying and reporting unsafe conditions
2. Skill in selecting and using personal protective equipment
3. Knowledge of ergonomic impact of work techniques
4. Knowledge of proper techniques for lifting loads
5. Knowledge of safety requirements for platforms, man lifts, and ladders
6. Knowledge of safety requirements for material handling equipment such as forklifts, cranes, rigging, and pry trucks
7. Knowledge of safety requirements for manual, electrical-powered, and pneumatic tools
8. Knowledge of safety requirements for operation of automated machines/ automated processes

Safety Policies and Regulations

1. Knowledge of basic filing procedures to properly store inspection records
2. Knowledge of safety requirements and environmental regulations related to performing inspections

3. Knowledge of policies and procedures needed to perform audits and train employees about hazardous conditions
4. Knowledge of company safety standards for handling potential hazards
5. Knowledge of how to safely store, identify, and use hazardous materials and pressurized vessels
6. Knowledge of OSHA and other health and safety requirements as applied to the workplace
7. Knowledge of government policies, procedures, and regulations governing the safe use of equipment
8. Knowledge of procedures to prevent or reduce emissions and spills
9. Knowledge of Hazardous Materials (HAZMAT) procedures information
10. Knowledge of Material Safety Data Sheets (MSDS)
11. Knowledge of applicable safety standards
12. Knowledge of which tools and equipment require safety certification
13. Knowledge of what the law requires companies to post or publish in order to keep employees abreast of OSHA and other government regulations
14. Knowledge of EPA required documentation for (a) disposal of hazardous waste generated during maintenance or (b) transportation of contaminated items
15. Knowledge of accident documentation procedures

Safety-related Maintenance Procedures

1. Knowledge of equipment operation and design parameters to determine if machine is operating safely
2. Skill in reviewing environmental data systems in the factory
3. Skill in making adjustments to equipment to ensure that it is operating within established safety and environmental parameters
4. Skill in regularly monitoring equipment for unsafe conditions

Safety Training

1. Skill in developing and/or delivering safety training per guidelines
2. Knowledge of health and safety education requirements
3. Knowledge to identify safety training courses
4. Knowledge of equipment manual and standard practice manual to repair equipment safely
5. Knowledge of certifications needed for regulatory compliance (i.e., Cardio Pulmonary Resuscitation (CPR), Fire extinguisher, and Blood born Pathogens)
6. Skill in conducting equipment safety demonstrations
7. Skill in training other workers in proper safety procedures during maintenance process
8. Knowledge of the tools and materials needed to operate equipment to train others
9. Skill in using monthly safety meetings to improve the safety environment and communicate changes in regulations

Communication Skills that Enhance Safety

1. Knowledge of ways to improve reading, listening and writing skills
2. Knowledge of techniques for making effective presentations to internal and external customers, including safety orientations
3. Skills in using different forms of communication, such as e-mail, fax and phone
4. Skills in providing effective feedback and making suggestions
5. Skill in communicating customer needs effectively to others including shift-to-shift, coworkers, & managers, including needs that impact safety.

Teamwork skills that Enhance Safety

1. Knowledge of the characteristics of a high-performance team

2. Knowledge of roles and responsibilities of production team members
3. Skill in using teamwork to deal with customer requests
4. Knowledge of ways to align team goals to customer and business production needs
5. Skills in ensuring that team goals are specific, documented, measurable and achievable
6. Skill in communicating production information to team members
7. Skill in using team problem-solving and conflict resolution processes

Training skills that Enhance Safety

1. Knowledge of how training needs are assessed regularly to identify new requirements and training issues
2. Skill in conducting training in an effective and appropriate manner to achieve training goals
3. Knowledge of ways to ensure that training materials are documented and available
4. Skill in ensuring that training is relevant to equipment, tools, materials, and processes at the workstation
5. Knowledge of ways to provide appropriate cross-training
6. Knowledge of ways to ensure that training documentation is accurate and current and meets all company and regulatory requirements

QUALITY PRACTICES & MEASUREMENT

Key Activities and Performance Indicators

1. Participate in periodic internal quality audit activities

- a. Audit data are relevant and correct
- b. All relevant audit forms are completed correctly and forwarded to the proper parties in a timely manner.
- c. Conformances to quality standards are properly assessed and documented.
- d. When appropriate, include observation of operation in audit to ensure process and product meet specifications
- e. Audit performed in accordance with company and other required schedules and procedures
- f. Ongoing audits are performed to optimize the outcomes of corrective actions

2. Check calibration of gages and other data collection equipment

- a. Calibration schedule is followed according to specifications
- b. Instrument certification is checked by reviewing documentation and through observation during use
- c. Instruments out of calibration are promptly recalibrated or referred to the appropriate parties for recalibration repairs

3. Suggest continuous improvements

- a. Potential improvements are recognized through observation and data analysis
- b. Measurable & data-driven benefits to the company/customers/employees are included in suggestions
- c. Suggestions are made according to proper procedures and documentation.
- d. Suggestions show that all relevant data were reviewed before making suggestions

4. Inspect materials and product/process at all stages to ensure they meet specifications

- a. Sampling and inspection occur according to schedule and procedures
- b. Inspection tools and procedures are selected and used correctly
- c. The calibration of testing equipment is verified
- d. Materials are inspected against correct specifications

- e. Products, processes and materials that do not meet specifications are identified promptly
- f. Implementation of corrective actions is verified through spot checks
- g. Inspection documentation is properly documented and reported to the correct parties

5. Document the results of quality tests

- a. Data forms are checked to ensure that they are complete and accurate
- b. Information is evaluated and interpreted correctly
- c. Data is forwarded to correct parties
- d. Correct analytical tools, including statistical process controls (SPC), are selected and used properly
- e. Reports are stored properly for the specified time frames

6. Communicate quality problems.

- a. Quality problems are reviewed with production operators
- b. Quality problems are communicated promptly to appropriate parties
- c. Quality problems are documented according to established processes
- d. Defect trends are summarized and reported to appropriate parties

7. Take corrective actions to restore or maintain quality

- a. Appropriate corrective actions are identified and approvals received when needed
- b. Recommendations for action are clear, concise and supported by data
- c. Recommendations are made promptly to the appropriate parties
- d. Adjustments are made in a timely manner to eliminate deviations and bring the process back into control
- e. Adjustments and follow-up product quality checks are properly documented in correct format

- f. Corrective action/quality improvements are implemented in a standardized manner

8. Record process outcomes and trends

- a. Records on quality process are maintained to appropriate standards.
- b. Outcomes of quality processes are charted according to appropriate methods and standards.
- c. Data on quality process performance is accurate
- d. Quality process performance data is analyzed to identify trends.
- e. Quality process performance data is reported to appropriate parties in a timely manner
- f. Previous documentation on similar process issues is examined to identify possible solutions

9. Identify fundamentals of blueprint reading

- a. Objects are effectively visualized in a drawing
- b. Blueprint features are correctly identified
- c. Dimensions of an object in a technical drawing are accurately read and understood
- d. The functions of sectional drawings are recognized

10. Use common measurement systems and precision measurement tools

- a. Both U.S. measurement and standard international metric systems are used and converted
- b. Parts are measured correctly using a machinist's rule and tape measure
- c. Part dimensions are measured correctly using a caliper and micrometer
- d. A computer is used correctly to measure data from a digital gage

Basic Technical Knowledge and Skills₂

Overall Quality Process

1. Knowledge of quality standards and how they apply to products to make effective decisions about quality problems
2. Knowledge of quality procedures and product specifications to identify nonconformance

3. Knowledge of the roles and responsibilities for quality in an organization
4. Skill in identifying product defects and defect patterns
5. Knowledge of how to check and test good products and non-conforming products
6. Knowledge of corrective action methods for dealing with non-conformances to avoid future occurrences
7. Knowledge of procedures for rejecting substandard products
8. Skill in developing and documenting quality procedures, check lists and methods
9. Skill in identifying inaccuracies in quality data and responding to them
10. Knowledge of quality terminology
11. Knowledge of company quality assurance procedures

Quality Systems and Inspection Tools

1. Knowledge of quality systems such as Statistical Process Control (SPC), Six Sigma, Total Quality Management (TQM), Lean Management, "Plan-Do-Check-Act," and International Standards Organization standards, especially ISO 9001:2000 for manufacturers
2. Skill in selecting and using quality systems to identify problems and record quality issues
3. Knowledge of statistical quality tools (e.g., Root Cause Failure Analyses and Pareto charts) in reaching accurate decisions about quality data
4. Knowledge of how to accurately troubleshoot and categorize defect types to determine root cause.
5. Knowledge of how to create control charts (e.g., variables and attributes)
6. Knowledge of how to record and analyze quality issues in the production process, using tools such as Root Cause Failure Analyses (RCFA)
7. Knowledge of Pareto analysis to identify priorities for solving multiple sub –standard product problems
8. Skill in determining accuracy and precision when using measuring equipment
9. Knowledge of performance indicators that can be readily understood by operators
10. Knowledge of how to use inspection tools, equipment and procedures
11. Knowledge of inspection equipment calibration standards and requirements
12. Skill in verifying calibration of inspection equipment
13. Knowledge of appropriate automated inspection system
14. Skill in using hand-held inspection devices to examine materials.
15. Skills in maintaining and storing inspection tools

Corrective Action

1. Skill in determining corrective action
2. Knowledge of company's corrective action procedures to follow up on quality problems and corrective measures
3. Knowledge of health and safety standards to ensure quality problems are addressed correctly without impairing health and safety
4. Knowledge of how to conduct follow-up activities to validate that corrective action has been taken
5. Knowledge of how to access and previous documentation to help develop solutions
6. Knowledge of when to stop process to prevent production of defective product
7. Skill in correctly tagging and segregating non-conforming material
8. Skill in investigating non-conformances (e.g., rejection tags) to determine root cause and recommend corrective action

Quality Documentation

1. Knowledge of how to complete proper forms to document problems and corrective action
2. Skill in using computer systems to document and track substandard and scrapped parts, materials, and assemblies as required by quality processes

3. Knowledge of documentation process and requirements to ensure verifiable evidence of product quality
4. Knowledge of quality system protocol for performing an audit
5. Knowledge of the procedure for reviewing quality problems with operators to provide feedback
6. Knowledge of correct approval procedures to document inspection results
7. Knowledge of procedures for recording and storing product history and maintaining records
8. Knowledge of how to use route sheets and statistical method charts to document process
9. Knowledge of follow-up and reporting documentation procedures to ensure proper communications

Blueprint Reading Fundamentals

1. Knowledge of visualizing objects from a multi-view drawing
2. Knowledge of identifying product features from a multi-view drawing
3. Knowledge of identifying dimensions and tolerances of an object from a multi-view drawing
4. Knowledge of interpreting geometric dimensioning and assembly tolerances on a drawing
5. Knowledge of interpretation of title blocks
6. Skill in interpreting assembly drawings

Basic Measurement

1. Skill in converting measurements in U.S. measurement and standard international metrics systems
2. Skill in using a machinist's rule to measure parts
3. Skill in using a tape measure to measure parts
4. Skill in using dial and digital calipers to measure parts
5. Skill in using a micrometer to measure parts
6. Skill in using a dial indicator to measure parts
7. Skill in collecting measurement data from a digital gage using a computer

MANUFACTURING PROCESSES & PRODUCTION

Key Activities and Performance Indicators

1 . Identify customer needs

- a. The different and common needs of internal and external customers are recognized
- b. Customer contact about product aspects and printed specifications is maintained to ensure understanding of needs
- c. Customer needs are reviewed on a regular basis
- d. Customer specifications are up-to-date
- e. Customer needs are communicated effectively to others including shift-to-shift, coworkers, and managers
- f. Issues preventing customer needs from being met are addressed proactively

2. Determine resources available for the production process

- a. Raw materials are checked against work orders
- b. Tools and equipment are checked against work orders
- c. Discrepancies are communicated to the proper parties
- d. Necessary resources are at the workstation when required
- e. Workers with appropriate skills are scheduled according to production needs

3. Set up equipment for the production process

- a. Proper repairs and adjustments are made to production equipment prior to putting into service

- b. Set-up meets process requirements and product specifications.
- c. First piece or production run meets specifications
- d. Set-up procedures are documented for repeatability
- e. Set-up meets ergonomic and other relevant health, safety, and environmental standards
- f. Set up meets equipment specifications

4. Set team production goals

- a. Team goals are specific, measurable, and achievable
- b. Team goals are aligned with customer and business needs
- c. Team goals focus the team in order to meet team objectives
- d. Team goals are documented and communicated to all parties

5. Make job assignments

- a. Jobs assignments match skills with the production work to be done
- b. Job assignments maximize the use of available skills
- c. Job assignments ensure business and customer needs are met
- d. Workers are notified of job assignments effectively

6. Coordinate work flow with team members and other work groups

- a. Production schedules are met effectively
- b. Team members are notified of schedule requirements in a timely way
- c. Production workflow runs efficiently
- d. Downtime is minimized
- e. Relationships with others facilitate effective workflow
- f. Workers actively participate in meetings and problem-solving groups

7. Communicate production and material requirements and product specifications

- a. Communication reflects knowledge of production requirements, levels, and product specifications
- b. Communication reflects knowledge of material specifications and delivery issues and schedules
- c. Communication demonstrates knowledge of customer and business production needs
- d. Communication is initiated cross-functionally and made in a timely and accurate manner to the correct parties
- e. Communication is clear and relevant to production and products
- f. Communications are tracked and documented, as appropriate

8. Perform and monitor the process to make the product

- a. Process control data indicate that the manufacturing process is meeting product specifications
- b. Manufacturing process cycle time meets customer and business needs
- c. Product meets customer specifications
- d. Products are labeled appropriately for compliance or non-compliance
- e. Production operations comply fully with all health, safety, and environmental policies and practices

9. Document product and process compliance with customer requirements

- a. Documentation of compliance is legible
- b. Documentation of compliance is written in the appropriate format and correctly stored
- c. Documentation of compliance is forwarded to the proper parties
- d. Documentation is complete and "sign off" is obtained
- e. Products are labeled appropriately for compliance or non-compliance

10. Prepare final product for shipping or distribution

- a. Packaging materials meet packaging and shipping specifications, including proper labeling and safety requirements

- b. Completed documentation of customer packaging and shipping instructions accompany product to next destination
- c. Product availability is communicated to the proper parties in a timely manner
- d. Product and all relevant information—such as quantity, destination, and packaging instructions—are checked against the work order
- e. Product is correctly stored or staged for shipping
- f. All laws and regulations with regard to labeling, packaging, and transport are followed.
- g. Material handling procedures are followed to prevent product damage

Basic Technical Knowledge and Skills:

Work Flow Planning and Control

1. Knowledge of principles of Lean Manufacturing and High Performance Work Organizations
2. Skill in making job assignments and coordinating workflow
3. Skill in knowing that the appropriate resources are available to meet customer specifications
4. Skill in ensuring that set-up and operation procedures are available and up-to-date
5. Skill in correctly reading and interpreting a production schedule and manufacturing work order
6. Knowledge of production process, including flow and bottlenecks
7. Knowledge of lead-time required for a production plan
8. Skill in correctly reading and interpreting bills of materials and routing sheets
9. Knowledge of methods of productivity measurement and improvement
10. Knowledge of principles and practice of Just-in-time (JIT) inventory control
11. Knowledge of ways to perform a physical inventory

Production equipment operations

- a. Skill in starting and operating production machines
- b. Skill in perform emergency shutdown of production machines
- c. Skill in recognizing and addressing machine malfunctions
- d. Knowledge of common types of mechanisms used in machines
- e. Knowledge of ways in which force and torque are used in machine operations
- f. Knowledge of the impact of friction on machine operation and methods
- g. Knowledge of the use of cams
- h. Knowledge of the ways in which machines use pulley and gear drives
- i. Knowledge of the ways in which manufacturing processes are used to make and finish parts
- j. Skill in using basic types of manual machine tools, such as drill press and cutoff saw
- k. Knowledge of basic machine tooling

Production Materials, Tools and Equipment

1. Knowledge of various materials used in production
2. Knowledge of machinery operation, set up and testing
3. Skill in reading and interpreting gages (i.e., analog, digital and vernier)
4. Knowledge of how to determine whether additional tools need to be purchased
5. Knowledge of lubricants and coolants to make the proper selection
6. Skill in setting up, programming, and operating the computerized control process
7. Knowledge of equipment capabilities to maximize productivity
8. Skill in making machine adjustments
9. Knowledge of how to order tools and materials

Work Orders and Documentation

1. Skill in interpreting work orders to meet customer needs
2. Skill in reviewing order sheets to determine if on-site adjustments are needed.
3. Knowledge of how to use diagrams and technical drawings.

4. Skill in interpreting route sheets and operation sheets to set-up and operate machine.
5. Skill in completing compliance tag to indicate that the sub-assembly meets the customer requirements.
6. Knowledge of customer shipping instructions to determine packing requirements.
7. Knowledge of available packing materials to determine packing requirements.
8. Knowledge of available packing materials to determine the safest method of shipping the product.

MAINTENANCE AWARENESS

Key Activities and Performance Indicators

1. Perform preventive maintenance and routine repair

- a. Preventive maintenance schedule is prepared and checked as appropriate
- b. Preventive maintenance is performed to schedule
- c. Preventive maintenance is documented completely and in a timely manner
- d. Repair needs are communicated to the correct parties using the right procedures and forms
- e. Any necessary repair work is checked through follow up
- f. Necessary supplies are available to perform preventive maintenance
- g. Preventive maintenance schedules, documentation, equipment needs and outstanding repairs are communicated effectively from shift-to-shift, to team members, to managers and to others as required
- h. All safety procedures are followed when doing repairs

2. Monitor indicators to ensure correct operations

- a. Current equipment performance is regularly compared to optimal equipment operations
- b. Abnormal equipment conditions are investigated
- c. Abnormal equipment conditions are corrected in a timely manner
- d. Equipment is monitored to ensure that the corrective action solved the problem
- e. Documentation of equipment repair history is complete, up-to-date and accurate

3. Perform all housekeeping to maintain production schedule

- a. Tools are stored in the proper location
- b. Materials are stored in a safe manner
- c. Unsafe conditions are identified and reported promptly
- d. Corrective action is taken to correct unsafe conditions
- e. Workstation clean and clear of safety hazards
- f. Scheduled housekeeping inspections are passed
- g. Workstation to organized to maximize efficiency

4. Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems with:

- a. Electrical systems
- b. Pneumatic systems
- c. Hydraulic systems
- d. Machine automation systems
- e. Lubrication processes
- f. Bearings and couplings
- g. Belts and chain drives

Basic Technical Knowledge and Skills⁴

Overall Maintenance Process

1. Knowledge of principles of Total Productive Maintenance (TPM)
2. Knowledge of equipment to be maintained and monitored
3. Skill in troubleshooting to identify a problem with equipment

4. Skill in following preventive maintenance schedules
5. Knowledge of job specific guidelines or collective bargaining agreement that affect maintenance
6. Skill in recognizing significant wear and tear on equipment components
7. Knowledge of the procedures for logging repairs and work order requests
8. Knowledge of the most common causes of failure of equipment to diagnosis problem quickly
9. Knowledge of what the equipment alarms mean
10. Skill in making on-process adjustments during production

Maintenance of Tools and Equipment

1. Knowledge of materials management to know what is recyclable and what is not
2. Skill in using appropriate maintenance tools to maintain machines
3. Knowledge of how to use monitoring or diagnostic devices to find out when equipment is operating correctly

Documentation of Maintenance

1. Knowledge of statistical methods charts to ensure that equipment is producing a quality product
2. Knowledge of forms and procedures for correctly documenting processes (e.g., preventative maintenance forms)
3. Knowledge of diagrams, schematics, manuals and specifications to understand how to repair equipment
4. Skill in documenting repairs, replacement parts, problems and corrective actions to maintain log to determine patterns of operation
5. Skill in reviewing maintenance log/checklist to ensure that recommended preventative procedures are followed

Maintenance-related Safety

1. Knowledge of set-up to verify machine safety
2. Knowledge of safety procedures to prevent accidents
3. Knowledge of the certification/license requirements to operate specific equipment.
4. Knowledge of how to use and store hazardous materials and chemicals (e.g., compliance with MSDS)
5. Knowledge of Lock out/Tag out policies and procedures.
6. Skill in visually inspecting equipment to ensure safety compliance before operating.
7. Skill in identifying and reporting unsafe work conditions.
8. Knowledge of materials management to know what is recyclable and what is not.

Potential maintenance issues with basic production systems

1. Knowledge of electrical systems reliability issues, including knowledge of when to inform maintenance personnel
2. Knowledge of pneumatic systems reliability issues, including knowledge of when to inform maintenance personnel
3. Knowledge of hydraulic systems reliability issues, including knowledge of when to inform maintenance personnel
4. Knowledge of machine automation systems reliability issues, including knowledge of when to inform maintenance personnel

Proper lubrication procedures

1. Skill in taking oil samples and analyzing them correctly
2. Skill in using lubricants correctly for various types of equipment
3. Skill in operating grease guns correctly for various types of lubrication
4. Skill in storing and disposing of lubricants safely

Bearings and coupling reliability

1. Knowledge of proper functioning of mechanical power transmission equipment, including knowledge of when to inform maintenance personnel
2. Knowledge of proper functioning of bearings and shafts, including knowledge of when to inform maintenance personnel
3. Knowledge of proper functioning of couplings, including knowledge of when to inform maintenance personnel

Belt and chain drive reliability

1. Knowledge of proper functioning of belt drive systems, including knowledge of when to inform maintenance personnel
2. Knowledge of proper functioning of roller chain drive systems, including knowledge of when to inform maintenance personnel
3. Knowledge of proper adjustment of chain sags is recognized, including knowledge of when to inform maintenance personnel

Handout #4 (2 pages)

Industry Certification to AAS/AS Degree Articulation Statewide Agreement Worksheet Summary

AAS/AS Degree Name: Engineering Technology

AAS/AS CIP Numbers:

Engineering Technology Support Specialist (CCC) 0615.061304

Advanced Manufacturing Specialization: 1615.061300/0615.061300

Quality Specialization: 1615.070201/0615.070201

Mechanical Design & Fabrication Specialization: 1615.080500/0615.080500

Electronics Specialization: 1615.030312/0615.030312

Advanced Technology Specialization: 1615.040301/0615.040301

Admission Requirements: Students entering the Associate in Applied Science and or the Associate in Science Program in **Engineering Technology** must have a standard high school diploma or its equivalent, or a CPT Eligible Certificate of Completion. Students must meet the requirements of State Board Rule 6A-10.0315(3), FAC (College preparatory testing, placement, and instruction. --). Students earning scores less than those listed shall enroll in college preparatory communication and computation instruction.

Other admission requirements: None

Validation Mechanisms: Industry Certification: Credit in escrow pending successful completion of nine (9) credit hours in the program core/electives with at least one course in the Engineering Technology Support Specialist program core.

Community college faculty committee met and agreed to propose that the Colleges offering the Engineering Technology AAS/AS degree agree that the “**MSSC Production Technician Certification**” credential from the Manufacturing Skills Standards Council shall articulate **fifteen (15)** college credit hours to the AAS/AS Degree in **Engineering Technology** as delineated below:

The common core of the Engineering Technology degree consists of 18 credit hours of technical core courses bundled as an 18 credit hour College Credit Certificate (Engineering Technology Support Specialist, CIP Number: 0615.061304) from the following areas:

1. Instrumentation and measurement (3 credit hours)
2. Manufacturing processes and materials (3 credit hours)
3. Quality (3 credit hours)
4. Electronics (3 credit hours)
5. Safety (3 credit hours)
6. Computer-aided drafting (3 credit hours)

The industry certification shall provide credit for the college’s course in areas 1-5 of this common core. Area 6, Computer-aided drafting, is not included in the articulation as these competencies are not adequately verified by the certification.

This agreement does not preclude but encourages the awarding of additional credits by any college through local agreements.

Community College: AAS/AS in Engineering Technology.

| | | |
|--|-----------|--------------|
| General Education | <u>15</u> | credit hours |
| Common Core (Engineering Technology Support Specialist (CCC))... | <u>18</u> | credit hours |
| Program Specialization Core/Electives | <u>27</u> | credit hours |
| Total AAS/AS Degree Program | <u>60</u> | credit hours |

Will award course credits or a block of credit toward AAS/AS program for 15 hours of credit.

July 2008

**Florida Department of Education
Curriculum Framework**

Degree Title: Engineering Technology
Program Title: Engineering Technology Support Specialist
Occupational Area: Industrial Education
Components: One core and five specialization tracts
Career Cluster: STEM

PSV
CIP Number: 0615.061304
Grade Level: College Credit Certificate
Length: 18 credit hours
SOC Code: 17-3029

- I. **MAJOR CONCEPTS AND CONTENT:** The purpose of this program is to prepare students for initial employment with an occupational title as Engineering Support Specialist or Engineering Specialist in various specialized areas, or to provide supplemental training for persons previously or currently employed in these occupations. **This certificate program is the core of the Engineering Technology degree program.**

The content should include, but not be limited to, communication skills, leadership skills, human relations and employability skills, technical competency, safe and efficient work practices and a combination of theory and laboratory activities to gain the necessary cognitive and manipulative skills to perform preventive and corrective maintenance and support for engineering design, processes, production, testing, and/or maintaining product quality.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Engineering Technology and Industrial Applications: production materials and processes, quality, computer-aided drafting, electronics, mechanics, instrumentation and safety.

- II. **PROGRAM STRUCTURE:** As part of an Associate in Science (A.S.) Degree and an Associate in Applied Science (A.A.S.) Degree, there is a major component of general education requirements which allows the student to more easily relate the technical knowledge gained to a theoretical level and to allow for a greater knowledge expansion and transference in the future. This A.S. program requires a minimum of 15 semester hours of general education. At least two components of

this core must be courses designed to develop skills in oral and written communication and in computational skills. For the A.A.S. degree 15 hours of general education are required. Students enrolling in this program must meet the minimum skills requirements in writing, reading, and mathematics as stipulated in State Board of Education Rule 6A-10.315.

This degree is a planned sequence of instruction consisting of eight tracts with one common core. It is recommended that students complete the core or demonstrate a mastery of the student performance standards contained in the core before advancing to the course(s) in the next level of specialization. The common core consists of 18 credit hours of technical core courses from the following areas: instrumentation and measurement, manufacturing processes and materials, quality, computer-aided drafting, electronics, and safety. The total Associate in Science /Associate in Applied Science degree program(s) consists of 60 credit hours.

The 18 credit hour technical core has been defined to align with the Manufacturing Skills Standards Council's (MSSC) skills standards. MSSC skill standards define the knowledge, skills, and performance needed by today's frontline manufacturing workers. After completing this core and the General Education requirements, it is anticipated that students will be prepared to pass the MSSC Production Technician Certification.

- III. **LABORATORY ACTIVITIES:** Laboratory activities are an integral part of the program. The tools, test equipment, materials, processes and safety practices used in these laboratory activities are similar to those used in industry. The activities provide instruction in maintenance techniques, computer aided drafting/design skills, technical communications, maintenance and operation of various industrial components, quality control and testing, material handling protocols, and proper usage of tools and instrumentation.
- IV. **SPECIAL NOTE:** SkillsUSA is the appropriate career student organization (CTSO) for providing leadership training and for reinforcing specific vocational skills. Career Student Organizations shall be an integral part of the career instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, FAC.

The cooperative method of instruction may be utilized for this program. Whenever the cooperative method is offered, the following are required for each student: a training plan, signed by the student, teacher, and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a workstation that reflects equipment, skills and tasks that are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

To be transferable statewide between institutions, this program/course must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This

does not preclude institutions from developing specific program or course articulation agreements with each other.

When a secondary student with a disability is enrolled in a vocational class for which modifications to the curriculum framework have been made, the particular outcomes and student performance standards that the student must master to earn credit must be specified in the student's Individual Educational Plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

V. **FEDERAL AND STATE LEGISLATION** requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Adult students with disabilities must self-identify and request such services. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

VI. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of industrial processes and material properties.
- 02.0 Generate and interpret computer-aided drawings.
- 03.0 Demonstrate a fundamental understanding of electronics and electricity.
- 04.0 Demonstrate an understanding of industrial safety, health, and environmental requirements.
- 05.0 Demonstrate proficiently in the use of quality assurance methods and quality control concepts.
- 06.0 Demonstrate proficiency in using tools, instruments and testing devices.
- 07.0 Demonstrate basic troubleshooting skills.
- 08.0 Demonstrate appropriate communication skills.
- 09.0 Demonstrate appropriate math skills.
- 10.0 Demonstrate an understanding of modern business practices and strategies.
- 11.0 Demonstrate employability skills.

Handout #6 (2 pages)

Engineering Technology Forum October 4-5, 2007 Brevard Community College General Summary

The 19th Engineering Technology Forum was hosted by Brevard Community College in Palm Bay. Representatives from thirteen community colleges attended the fall Forum. Dr. Joe Smith, Provost, Palm Bay Campus, welcomed the members to Brevard CC with Brad Jenkins and Joanne Hutton providing the overview and agenda of the Forum.

With the main theme, the Review of the New Engineering Technology Curriculum, Brad Jenkins and Marilyn Barger, presented the state approved Engineering Technology curriculum and frameworks that were developed through the committees in the Manufacturing Technology Workshops this past year. This new program went into effect July 2007 and SPC, CFCC, FCCJ, and Brevard CC have approved this curriculum and are offering courses this fall. Several other colleges are expected to pick up this new curriculum for next year. Marilyn also remarked that a marketing plan and materials were being developed for this new Engineering Technology program. Some of the major advantages of these frameworks allow for the flexibility to expand into new technologies and specialize with a minimum of credit hours.

The technical core is also aligned with the Manufacturing Skills Standards Council (MSSC) Production Technician Certificate. This certificate is now a national standard and is being accepted by industry. Eric Owens, State Supervisor, Industrial Education, presented the state of Florida Articulation Agreement that maps the MSSC Skills to the FLDOE Frameworks. The members of the Forum gave the approval for this articulation to occur. Other discussions focused on the articulation with the universities that have BSET programs and the consolidation of the EET and ETI State course Numbering System (SCNS).

In regards to enrollment and recruitment concerns, Chrys Panayiotou and Jose Farinos from Indian River CC, presented their new approach to increase enrollment in their Electronics program incorporating the photonics curriculum model. Much of the topic discussion centered on the perception and public image of electronics, the use of the term electronics, focusing on other marketing attempts to increase awareness and industry needs, competition from the private schools and training centers, program developments from other colleges, and hiring part time recruiters that understand the technical programs to go out to high schools.

Lunch, was sponsored by Harris Corporation and that was followed by a tour of Brevard's engineering/electronics and composite laboratories. Meer Almeer and Bruce Heshner gave a most interesting update of the facilities and the programs advances that are being offered.

The afternoon sessions involved vendors and began with Hulas King, representing Siemens PLM software, with a presentation on innovation and product improvement using their Unigraphics NX2 software tools. Vince Accardi, National Instruments, presented the latest version of Multisim and LabView with circuit simulation and instrumentation techniques. Prentice-Hall sponsored the afternoon break and continues to support the CAD programs with their new AutoDesk textbooks. Gary Koser gave an update on the CAD discipline committee that met earlier in the fall to consolidate the ETD numbers for the AutoCAD and Solidworks courses.

The Friday morning session began with an industry round table panel that included members of the Brevard Advisory Committee, who addressed the program and hiring needs of the local industry in the Brevard county area. The Forum heard from Harris, Quality Electronic Manufactures, and Rockwell-Collins during this industry interface.

Additional Forum discussion in the morning centered on new certificate program development from the colleges, industry involvement, and enrollment trends around the state.

Eric Owens, the state of Florida Supervisor of Industrial Education presented an update on a number of state projects that are on-going including the new information on the 2007-08 SUCCEED Florida Grants, the Department of Education Workforce Education programs, and the Critical Jobs Initiative. There was also some discussion related to the Perkins Act and the definition of program completers. Eric was also recognized and thanked by FLATE for his fine help in the submission and approval process for the new curriculum frameworks related to the A.S. degree in Engineering Technology and the different certificates associated with this degree.

The Spring Engineering Technology Forum will be held at Pensacola Junior College, in March, 2008 and the fall 2008 Forum will be at Seminole Community College.

Following the adjournment of the Forum at 12:00PM, the FL-ATE Manufacturing Technology Workshop was held in the afternoon and conducted by Marilyn Barger.

Respectfully submitted,

Brad Jenkins
St. Petersburg College
Co-Chairman ET Forum