

July 2010

**Florida Department of Education  
Curriculum Framework**

**Program Title:** Six Sigma Black Belt Certificate  
**Specialization Tract:** Quality  
**Career Cluster:** Manufacturing

<b>CCC</b>	
CIP Number	0615070202
Program Type	College Credit Certificate (CCC)
Program Length	12 Credit Hours
CTSO	SkillsUSA
SOC Codes (all applicable)	17-3026
Targeted Occupation List	<a href="http://www.labormarketinfo.com/wec/TargetOccupationList.htm">http://www.labormarketinfo.com/wec/TargetOccupationList.htm</a>

### **Purpose**

This certificate program is part of the Engineering Technology AS/AAS degree program (0615000001).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the manufacturing career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the manufacturing career cluster.

The content includes but is not limited to the six sigma methodology of problem solving, strategic improvement, and business transformation. The specifics of this certificate program will focus on the theory and methods of Six Sigma and concentrates using facts and data to improve customer satisfaction, reduce cycle time, and reduce defects.

### **Laboratory Activities**

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

## **Special Notes**

### **Career and Technical Student Organization (CTSO)**

SkillsUSA is the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

### **Accommodations**

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. 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.

## **Standards**

After successfully completing this course the student will be able to perform the following:

- 01.0 Demonstrate proficiency in Six Sigma theories.
- 02.0 Demonstrate proficiency in developing a Six Sigma project.

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**Florida Department of Education  
Student Performance Standards**

**Program Title:** Six Sigma Black Belt Certificate  
**CIP Number:** 0615070202  
**Program Length:** 12 Credit Hours  
**SOC Code(s):** 17-3026

This certificate program is part of the Engineering Technology AS/AAS degree program (0615000001). At the completion of this program, the student will be able to:

- 01.0 Demonstrate proficiency in six sigma theories--The student will be able to:
- 01.01 Apply the five steps of the DMAIC model.
  - 01.02 Establish an advanced quality plan using the theories of Six Sigma.
  - 01.03 Develop the basic cause-and-effect diagram (fishbone diagram).
  - 01.04 Describe and develop the central limit theorem.
  - 01.05 Develop a control plan to aid in production.
  - 01.06 Define the cost-benefit analysis on the shop floor.
  - 01.07 Define and describe the design of experiments (DOE) used in manufacturing processes.
  - 01.08 Run the experiment.
  - 01.09 Apply the DOE in a manufacturing process using the proper techniques.
  - 01.10 Apply the techniques of Failure Modes and Effects Analysis (FMEA).
  - 01.11 Define and describe Risk Assessment.
  - 01.12 Implement the 5S method of sorting, setting in order, shining, standardizing, and sustaining.
  - 01.13 Maintain and check the process through quality auditing.
- 02.0 Demonstrate proficiency in developing a six sigma project--The student will be able to:
- 02.01 Defines and describe the economic evaluation of engineering alternatives and analysis of cost allocation in technical operations.
  - 02.02 Calculate net profit, maximum profit and breakeven points when solving problems.
  - 02.03 Solve problems involving alternative designs, materials, or methods.
  - 02.04 Analyze the factor of equivalence in engineering economic problems.
  - 02.05 Solve problems related to replacement versus augmentation for economic choices.
  - 02.06 Discuss how capital projects are identified and evaluated.
  - 02.07 Describe how final projects are selected.
  - 02.08 Define the requirements of the project plan.
  - 02.09 Develop the initial project schedule.
  - 02.10 Describe each phase of the project as it relates to the budget.
  - 02.11 Develop timeline charts for planning and tracking.
  - 02.12 Apply the scheduling control systems.
  - 02.13 Identify the voice of the customer as the feedback mechanism.
  - 02.14 Define and describe the scheduling techniques when applied in the project environment.

- 02.15 Define and describe the issues surrounding a problem to provide paths for a solution.
- 02.16 Describe the project life cycle.
- 02.17 Solve problems related to capacity factor, load factor, and diversity factors.
- 02.18 Define and describe the concepts and methods for implementing Six Sigma project management utilizing Six Sigma methodologies.
- 02.19 Develop a Six Sigma project by utilizing the Six Sigma methodologies.
- 02.20 Describe and define the design phase for a Six Sigma project.
- 02.21 Describe and define the verification phase for a Six Sigma project.
- 02.22 Describe and define the implementation phase for a Six Sigma project.
- 02.23 Close out a Six Sigma project.
- 02.24 Benchmark a Six Sigma project.