July 2010

Florida Department of Education
Curriculum Framework

Program Title: **Lean Manufacturing**
Specialization Tract: **Advanced Manufacturing**
Career Cluster: **Manufacturing**

CCC	
CIP Number	0615061302
Program Type	College Credit Certificate (CCC)
Program Length	12 Credit Hours
CTSO	SkillsUSA
SOC Codes (all applicable)	17-3027
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

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 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.

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 the use of quality assurance methods, quality control concepts
02.0 Identify and implement lean concepts in manufacturing environments.
03.0 Identify, implement and/or interpret supply chain and operations management concepts and techniques.

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Florida Department of Education
Student Performance Standards

Program Title: **Lean Manufacturing**
Specialization Tract: **Advanced Manufacturing**
CIP Number: **0615061302**
Program Length: **12 Credit Hours**
SOC Code(s): **17-3027**

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 use of quality assurance methods, quality control concepts -- The student will be able to:

- 01.01 Monitor processes for quality.
- 01.02 Inspect product for quality.
- 01.03 Document quality measurements or observations by filling out quality charts and records.
- 01.04 Compare process measurements to standards.
- 01.05 Identify root causes using standard techniques.
- 01.06 Identify Corrective Action and Preventive Action.
- 01.07 Describe the concept of quality assurance in increasing productivity and promoting zero defects.
- 01.08 Apply data collection methods for productivity improvement and reporting.
- 01.09 Analyze data using tools and techniques for productivity and quality problems.
- 01.10 Analyze data using tools and techniques for cause and effect relationships.
- 01.11 Develop and apply quality improvement strategies.
- 01.12 Demonstrate an understanding of a quality process's capability and its applications.
- 01.13 Demonstrate knowledge of how to implement quality assurance principles and methods.
- 01.14 Demonstrate knowledge of quality assurance checks for inspections.
- 01.15 Demonstrate an understanding of internal and external supply chains.
- 01.16 Demonstrate understanding of the configuration of management.

02.0 Identify and implement lean concepts in manufacturing environments - The student will be able to:

- 02.01 Demonstrate product manufacturing requirements and processing flow.
- 02.02 Demonstrate the role of management in production operations.
- 02.03 Integrate personnel, hardware, and software capabilities for timely completion of products and product orders.
- 02.04 Apply manufacturing resources planning, just-in-time concepts to production and process planning.
- 02.05 Demonstrate good examples of lean manufacturing principles of pull production, perfect first-time quality, waste minimization, continuous improvement, flexibility, and building long lasting relationships with suppliers and customers.

02.06 Implement minimization of wastes in the form of waiting time, inventory, processing, motion, over-production, transportation, and scrap.
02.07 Apply the 5S's: Sort, Set in Order, Shine, Standardize, and Sustain.
02.08 Apply six sigma criteria correctly.

03.0 Identify, implement, and/or interpret supply chain and operations management concepts and techniques - The student will be able to:

03.01 Use appropriate software for supply chain management strategies.
03.02 Illustrate how efficiency and effectiveness are necessary attributes of good operations management.
03.03 Apply simulations used for layout and design of production operations.
03.04 Apply engineering economy factors in equipment justification.
03.05 Demonstrate warehouse throughput systems.
03.06 Demonstrate basic principles and methods of controlling work in progress.
03.07 Follow raw materials from their source to distribution of the product.
03.08 Demonstrate strategies to optimize production operations.
03.09 Demonstrate strategies to optimize raw materials and products inventories.