



# CHIPOLA COLLEGE

## COURSE SYLLABUS

Chipola's website: [www.chipola.edu](http://www.chipola.edu)

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**COURSE TITLE:**

Concepts of Lean Manufacturing and Six Sigma

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**COURSE NUMBER:**

ETI 2622

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**COURSE DESCRIPTION (with prerequisites):**

This course provides the student with an introduction to the fundamentals of lean, based on the concepts in the Toyota production system model of business function operating systems. A comprehensive overview of the lean and six sigma methodologies including the Define, Measure, Analyze, Improve, and Control (DMAIC) process improvement paradigm will be presented. 3 semester credit hours. Prerequisite course ETI 1110.

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**NAME(S) OF INSTRUCTORS:**

Nikole Brooks Bethea  
Bethean@chipola.edu

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**EFFECTIVE ACADEMIC YEAR:**

2022-2023

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**REQUIRED TEXTBOOKS AND INSTRUCTIONAL MATERIALS:**

Lean Six Sigma by Donna C.S. Summers, 11<sup>th</sup> Edition, ISBN-13: 9780135125106

Amatrol online resources

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**GRADING POLICY:**

The standing of a student in each course is expressed by one of the following letters and corresponding grading system:

**A – 90 – 100**

**B – 80 – 89**

**C – 70 – 79**

**D – 60 – 69**

**F – 59 or less**

The Chipola Catalog provides policies and procedures regarding the grading system. A student's Grade Point Average is derived from the grading system/quality point scale.

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**ATTENDANCE AND WITHDRAWAL POLICIES:**

Chipola College expects regular attendance of all students, and all instructors record attendance daily. Students who are absent from classes for any reason other than official college activities must satisfy the instructor concerned that the absence was due to illness or other clearly unavoidable reasons. Otherwise, the student may suffer grade loss at the discretion of the instructor. Chipola policy allows each instructor to specify in the Instructor First Day Handout whether or not an absence is excusable and what affect the absence or tardy may have on the grade.

A student is allowed to repeat a course a maximum of three (3) times. **On the third attempt a student (1) must bear the full cost of instruction (unless waived by Student Services), (2) cannot withdraw, and (3) must receive a grade.**

**MAKE-UP POLICY:**

Chipola allows each instructor to specify in the Instructor First Day Handout the makeup policy.

**ACADEMIC HONOR CODE POLICY:**

Students are expected to uphold the Academic Honor Code. Chipola College's Honor Code is based on the premise that each student has the responsibility to (1) uphold the highest standards of academic honesty in his/her own work; (2) refuse to tolerate academic dishonesty in the college community; and (3) foster a high sense of honor and social responsibility on the part of students. Further information regarding the Academic Honor Code may be found in the Chipola Catalog, Student Governance section.

**STUDENTS WITH DISABILITIES POLICY:**

Chipola College is committed to making all programs and facilities accessible to anyone with a disability. Chipola's goal is for students to obtain maximum benefit from their educational experience and to effectively transition into the college environment. Students with disabilities are requested to voluntarily contact the Office of Students with Disabilities to complete the intake process and determine their eligibility for reasonable accommodations.

**NOTICE OF EQUAL ACCESS/EQUAL OPPORTUNITY AND NONDISCRIMINATION:**

Chipola College does not discriminate against any persons, employees, students, applicants or others affiliated with the college with regard to race, color, religion, ethnicity, national origin, age, veteran's status, disability, gender, genetic information, marital status, pregnancy or any other protected class under applicable federal and state laws, in any college program, activity or employment.

Wendy Phippen, Associate Vice President of Human Resources, Equity Officer and Title IX Coordinator, 3094 Indian Circle, Marianna, FL 32446, Building A, Room 183C, 850-718-2269, phippenw@chipola.edu.

**LIBRARY AND ON-LINE REFERENCE MATERIALS:**

The library is a comprehensive learning resource center providing information in print, electronic, and multimedia format to support the educational objectives of the College. On-line catalogs, e-books and electronic databases can be accessed by using the *LINCCWeb* icon on the Chipola Library website at [www.chipola.edu/library](http://www.chipola.edu/library). If you have questions about database usage consult the "How to Use the Chipola Databases" on the Library website or call the Library at 850/718-2274 during regular hours. Library hours are posted each semester at the building entrance and on the Library website. See your Instructor First Day Handout for individual instructor recommendations and resources.

**TECHNOLOGY RESOURCES:**

The college’s learning management system is **Canvas**. Classes become available on Canvas on the first day of the semester. It is the student’s responsibility to log onto the Canvas system the first day of class to establish the first day of attendance and to check announcements. All official class communication must be through Canvas. For further information, contact your instructor or the Director of eLearning. The Canvas support hotline is available online in live chat and on the phone, toll-free, at 855-308-2812 for any issues in accessing or utilizing Canvas. The **Technology Center**, located in the library, is equipped with computer workstations. Lab hours are posted each semester at the building entrance and on the Library website.

**FREE TUTORING RESOURCES:**

The Academic Center for Excellence (**ACE**) Lab, located in Building L, offers free tutoring from 8 a.m. to 5 p.m. and is equipped with computer workstations. ACE lab hours are posted each semester at the room entrance and on the website. Additionally, Chipola College has contracted **Smarthinking**, a Pearson Company, for online tutoring services, accessible especially from 5 p.m. to 8 a.m. and weekends. Smarthinking can be accessed through Canvas.

**ELECTRONIC DEVICE USAGE STATEMENT:**

Classrooms should be free of all unnecessary distractions from the task of learning. Therefore, as a general rule, students should silence and avoid use of all electronic devices (laptops, phones, tablets, etc.) not being used for coursework. Consult first-day handouts for any specific policies related to the use of electronic devices in the classroom, as they may vary depending upon the nature of the course or the guidelines of the instructor. Faculty reserve the right to regulate the use of electronic devices and their accessories in class.

**DISCIPLINE SPECIFIC COMPETENCIES / LEARNING OUTCOMES:**

This course provides an introduction to the basic principles and theories of Lean Manufacturing. Lean Manufacturing involves identifying and eliminating non-value-adding activities in design, production, and supply chain management. The coverage includes topics related to cost reduction, work-free manufacturing, continuous flow, Kaizen, the 5S’s, value stream mapping, modular manufacturing, and overall equipment effectiveness (OEE).

<b>LINKING COURSE-LEVEL STUDENT LEARNING OUTCOMES WITH DISCIPLINE-SPECIFIC COMPETENCIES, ASSESSMENT METHODS, AND ARTIFACTS</b>			
<b>COURSE-LEVEL STUDENT LEARNING OUTCOMES FOR ETI 2622</b>	<b>DISCIPLINE-SPECIFIC GENERAL EDUCATION COMPETENCIES</b>	<b>ASSESSMENT METHODS FOR COURSE LEVEL STUDENT LEARNING OUTCOMES</b>	<b>LEARNING ARTIFACTS FOR AA PROGRAM ASSESSMENT</b>

<p>Upon the successful completion of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the basic concepts of Lean, based on the Toyota production system</li> <li>• Define the tools supporting the Lean model</li> <li>• Understand the rollout process</li> <li>• Recognize areas of improvement and the correct Lean tools to utilize</li> <li>• Understand the Six Sigma process and its impact on quality, customer satisfaction and costs</li> <li>• Design, analyze and deliver peer-to-peer appraisals based on Lean Transformation Leadership requirements</li> <li>•</li> </ul>	<p>Demonstrate an understanding of industrial processes and material properties.</p> <p>Demonstrate ability to generate and interpret computer-aided drawings (CAD).</p> <p>Demonstrate a fundamental understanding of electronics and electricity.</p> <p>Demonstrate an understanding of industrial safety, health, and environmental requirements.</p> <p>Demonstrate proficiency in the use of quality assurance methods and quality control concepts.</p> <p>Demonstrate proficiency in using tools, instruments, and testing devices.</p>	<p>Assessment methods used are:</p> <p>Q, T, SD</p>	
<b>**Assessment Codes</b>			

<b>T</b> = Tests <b>Pre/Post</b> = Pre- and Post-Tests <b>OT</b> = Objective Tests <b>UT</b> = Unit Tests <b>Q</b> = Quizzes <b>F</b> = Final Examination <b>CF</b> = Cumulative Final <b>EX</b> = Departmental Exam <b>SE</b> = Nat'l or State Standardized Exam	<b>RPT</b> = Report/Presentation <b>SP</b> = Skills Performance <b>SD</b> = Skills Demonstration <b>W</b> = Writing Assignments <b>E</b> = Essays <b>DE</b> = Documented Essays <b>RP</b> = Research papers <b>J</b> = Jury <b>R</b> = Recital	<b>Proj.</b> = Projects <b>Exp.</b> = Experiments <b>Cap. Proj.</b> = Capstone Project <b>Cap. Course</b> = Capstone Course <b>Prac.</b> = Practicum <b>Intern.</b> = Internship <b>H</b> = Homework <b>PS</b> = Problem Solving <b>DB</b> = Discussion Board	<b>BO</b> = Behavioral Observation <b>Clin.</b> = Clinicals <b>CS</b> = Case Study <b>CP</b> = Case Plan <b>Port.</b> = Portfolio <b>Obs.</b> = Teacher Observation <b>Sk. Check</b> = Skills Check-off Curriculum Frameworks <b>JP</b> = Judged Performance/Exhibition
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### **MEANS OF ACCOMPLISHING STUDENT LEARNING OUTCOMES:**

Assessments are determined by measuring the ability of each student to retain the learning outcomes and objectives of the course.

1. Learning modules for course theory delivered online.
2. Hands-on competency-based labs.
3. Assessments.

### **ASSIGNMENT AND/OR COURSE OUTLINE**

#### **Course Content:**

Lean Overview  
Foundations of Six Sigma  
Principles of Quality Management and Six Sigma  
Hands-on simulation  
DMAIC Methodology  
Project Organization, Selection, and Definition  
Process Measurement, Analysis, Improvement, and Control  
Kaizen  
Lean Theory and Process Flow  
Total Productive Maintenance  
Designing and Implementing Six Sigma  
Executive Summaries

#### **Assignments**

#### **ETI 2622 Concepts of Lean Manuf. & Six Sigma**

Assignments will consist of homework problems and reading from the textbook, eLearning materials from Amatrol, hands-on labs performed in class, lab reports, and other assignments at the instructor's discretion.

A primary focus of this course is the development of the State Curriculum Framework skills:

- Demonstrate an understanding of industrial processes, predictive maintenance programs, and material properties.
- Demonstrate proficiently in the use of quality assurance methods and quality control concepts inclusive of predictive and preventative maintenance theory;

program effectiveness, efficiencies and savings; Lean Operating Systems; Six Sigma; and DMAIC to create variation-free, value-added processes.

- Demonstrate proficiency in using tools, instruments and testing devices.
- Demonstrate basic troubleshooting skills in automated processes.
- Effectively communicate verbally and in writing within a variety of business environments.
- Apply mathematical concepts typical in manufacturing processes.
- Demonstrate an understanding of modern business practices and strategies and the implications of globalization and the impact of international trade on manufacturing in a competitive environment.

### **EXAMINATIONS:**

Assessments are determined by measuring the ability of each student to retain the learning outcomes and objectives of the course.

1. Attending classes
2. Completing book and computer assignments along with laboratory work.
3. Student must demonstrate an understanding theory of operating principles prior to starting lab sheets. Have the instructor sign and verify your lab sheets after completing each lab assignment. Turn in your lab sheets to the instructor for grading and recording.

### **CERTIFICATION ALIGNMENT:**

#### **Six Sigma Yellow Belt**

See your Instructor First Day Handout for individual instructor assignment schedule.