COURSE OUTLINE
Advanced Automated Manufacturing

Course Description:
IT 220. Advanced Automated Manufacturing with CNC. 3 hours credit. This course will enable the student to manufacture projects using automated CNC technology.

Course Relevance: The principles learned in this course will allow the student to understand advanced methods of automated manufacturing. This course will provide advanced skills that will assist the student in the real world of automated manufacturing.

Required Materials:
Gizelbach, R. CNC Machining. Tinley Park, IL: Goodheart-Wilcox

*For complete material(s) information, refer to: http://www.butlercc.bkstr.com

Learning Outcomes:
The intention is for the student to be able to:
1. Identify the major mathematical concepts of automated manufacturing.
2. Understand the role of automated manufacturing in the workplace.
3. Design and develop manufacturing strategies for a simple part.

Learning PACT
Through the student involvement in this course, the student will develop and document his/her achievement of the following PACT skills:
Primary skills (developed and documented):
1. Critical Thinking
   Through the use differing softwares, the student will be able to recognize and be able to choose best strategies to manufacture a part.
2. Problem Solving
   By understanding what the end result must be, the student will be able to define many problems before they are apparent and take proper measures to avoid those problems.
3. Field-Related Training
   Through the use of current practices, the student will be able to perform machining functions with a high level of proficiency judged by current industry standards.

Secondary skills (developed but not documented):
Health Management
Reading
Speaking

**Assessment Tasks:**
These learning outcomes and primary Learning PACT skills will be demonstrated by:
1. Manufacturing at least two advanced parts for the CNC mill and the CNC lathe.
2. Designing and finishing a part to meet specifications and end result usage in an industrial timeframe.

**Course Content:**
I. Themes - Key recurring concepts that run throughout this course:
   A. Quality
   B. Safety
   C. Repeatability
   D. Time Management
II. Issues - Key issues that will be addressed in this course: areas of conflict that must be understood in order to achieve the intended outcome:
   A. Attaining optimum manufacturing time while paying attention to quality safety and repeatability.
III. Concepts – Key concepts that must be understood to address the issues:
   A. Metal Removal Rates
   B. Best practices
   C. Cutting tool theory
   D. Attention to detail
IV. Skills / Competencies - Actions that are essential to achieve the course outcomes:
   A. Demonstrate ability to think in dimensions.
   B. Demonstrate safe shop practices.
   C. Demonstrate the accurate use of programming techniques.

**Learning Units:**
I. Basic machining programs (Mastercam, FeatureCam)
II. Theory of automated Manufacturing
III. Advanced manufacturing
IV. Advanced cutting tool theory

**Learning Activities:**
Learning activities will be geared towards designed “hands on” exercises. Classroom lecture is designed to enable the students to understand the key principles in process analysis, machining fundamentals, and correct use of associated equipment.

**Grade Determination:**
The student will be graded on satisfactory completion of assessment tasks
(learning activities), attendance, and written examination. Students will be administered a pre and post test for each unit. Pre tests are used merely to gauge academic growth.