University of Bridgeport

Department of Mechanical Engineering

***Syllabus for**: Production Technology and Techniques (MEEG-572 / TCMG-572), Fall, 2013*

***Instructor**: Jeremy (Zheng) Li, Ph.D, e-mail: zhengli@bridgeport.edu*

***Instructor Assistance**: Before or after class, or by appointment*

***Lecture Hours**: 9:30 am to 12:00 pm, Thursdays*

Course Description:

This course will focus on the process of developing creative solutions to issues in production technology and techniques. The topics cover the concepts of production layout, production processes, quality assurance and control, principles of manufacturing processes, and technology's role in assisting manufacturing processes in today's US industries. Two formal projects are assigned regarding the latest technologies in production that are used to support business products. The target of this class is to help students obtain a basic knowledge in production technologies and techniques, and help students get ready to face the challenging industrial and engineering job market.

Course Objective:

The industrial engineers of today and tomorrow must have a more complete knowledge of engineering research, product design, electronic-mechanical, hydraulic system, automated mechanisms through PLC, and computer aided engineering packages. To make the strong competition in today's challenging product markets, the organizations require to have its good production technology and techniques to well organize its business activities. Implementations of production technology and technique will save product process expenses, increase the manufacturing efficiency, improve the product quality and shorten the production period which will enhance the company's competition in the market. To understand the potential failures and effects on companies' daily production and manufacturing processes, several modeling and simulation tools will be used to help understanding the major factors that affect the manufacturing processes, process efficiency, product quality and production quantity. The product design, mechanical and manufacturing engineers with weak knowledge of production technology and technique will not well handle its products.

Course Learning Goals:

1. Students will develop their knowledge in production technology and techniques.
2. Students will learn how to investigate different concepts applied in production processes.
3. Students will learn the basic characteristics governing the applications of typical methods in production technology and techniques.
4. Students will also learn professional and ethical responsibility.

Expected Learning Outcomes:

1. Demonstrate an understanding of the critical elements in development of production technology and techniques.
2. Synthesis many potential solutions to a given basic production technical need.
3. Students will understand the most popular techniques in processes of production planning.
4. Use appropriate engineering data to select proper production planning methods.
5. Ability to understand and treat practical issues in production environment.
6. Ability to identify and manage dilemmas in production planning processes.

It is the student's responsibility to familiarize himself or herself with and adhere to the standards set forth in the policies on cheating and plagiarism as defined in Chapters 2 and 5 of the Key to UB http://www.bridgeport.edu/pages/2623.asp or the appropriate graduate program handbook

Schedule:

Sect (1) – Three Weeks

1. Introduction of production technology and techniques
2. The analysis and concept of different production planning methods
3. MRP
4. MRP II
5. The application of technology and techniques in industrial production

Sect (2) – Five Weeks

1. General technologies and real techniques in production planning
   1). Basic mechanism in production
   2). Important concept and methodology in production planning
   3). Critical relation between production technology/techniques and business strategy
2. BOM
3. EOQ
4. Engineering design and assembly production line setup
5. General technologies and real techniques in production planning
   1). Basic mechanism in production
   2). Important concept and methodology in production planning
   3). Critical relation between production technology/techniques and business strategy
6. Some class warm-up project studies
   1). The relation between production technology/techniques and organization's strategy
   2). The most efficient setup of work cell and layout in production and manufacturing processes

Sect (3) – Four Weeks

1. Production planning
2. Production scheduling
3. Production layout
4. Shop floor control
5. Labor & machine efficiency
6. Inventory control
7. Quality control
8. Production processes
9. Product quality assurance and control
10. SAP
11. Principles of machining processes
12. Hot and cold working
13. Machine tool operations
9. Application of class learnt knowledge to today's production planning processes

Sect (4) – Three Weeks

1. Advanced production technology and techniques
   1). Lower cost and proficient product control in production planning
   2). Concept of failure modes and effective analysis
   3). Concept of lean Manufacturing
   4). Concept of Six Sigma
   5). Concept of standard of operation procedures
2. Discussion and analysis of two class projects in applying of production technology and techniques that represent current US industrial production and manufacturing processes

Sect (5) – One Week

Project presentation

Cheating and plagiarism is absolutely unacceptable in any cases. The first offense will result in a warning and documented by the instructor and the second offense will result in an "F" for the course. Cheating and plagiarizing include using the work of others as your own, talking or looking around during exams and allowing others to look at your exam papers.

Textbook & Manual:

1. Teacher notes and some technical papers
2. Textbook:
   Manufacturing Engineering and Technology, Serope Kalpakjian & Steven R Schmid, Prentice Hall, 6th Ed, 2009, ISBN: 0136081681
   Modern Materials and Manufacturing Processes, Gregg Bruce & William K. Dalton, Prentice Hall, 3rd Ed, 2004, ISBN: 0-13-094698-2

Attendance Policy:

Students are responsible to acquire notes and assignments from classmates in case of absence.

The course will be graded as follows:

Project / Class Case Study & Discussion / Participation *60%/20%/20%*