University of Wisconsin - Madison
College of Engineering [EGR]
Last Offered: 2014 Spring [1144]
Direct Link to this Syllabus :
http://aefis.engr.wisc.edu/index.cfm/page/CourseAdmin.ViewABET?coursecatalogid=24&pdf=True

1. **M E 314, Manufacturing Fundamentals**
2. **Credits :** 3.00 **Contact Hours :** 4.5
3. **Textbook and Materials :** No textbook is needed. Handouts, additional reading materials, and Lab Manual are distributed, posted and available prior to the lectures and laboratories at Learn@UW Web site and e-COW2 Courses Web site.
4. **Specific Course Information :**
    a. **Brief description of the content of the course (Course Catalog Description) :** An introduction to techniques for modeling in materials processing and improving decision making in increasing the productivity of design and manufacturing processes. Quality improvement and engineering simulation tools are presented as well as the methods of engineering economy and the role of manufacturing automation and systems, through lectures and laboratories.
    b. **Pre-requisites or Co-requisites :** Stat 224 & ME 313 or cons inst
    c. **This is a Required course.**
5. **Specific Goals for the Course :**
    a. **Course Outcomes :**
        1. Introduce techniques and decision making tools for increased quality, product safety and reliability, and productivity
        2. Present quality improvement methods that lead to better quality, decreased cost, reduced cycle time, and sustainability
        3. Present methods of engineering economy for both improved professional and personal economical decision making
        4. Introduce the concept and practice of modern manufacturing systems including automation, control, metrology, and computer-aided engineering and manufacturing
    b. **ABET Student Learning Outcomes :**
        (f) Understanding of professional and ethical responsibility.
        (h) The broad education necessary to understand the impact of engineering solutions in a global and societal context.
        (i) Recognition of the need for and an ability to engage in life-long learning.
6. **Brief List of Topics to be Covered :**

    Modeling in Materials Processing:

    Dimensional Analysis;
    Transport Phenomena;
    Governing Equations;
    Computer Simulation;
    Term Project Using Computer-aided Engineering (CAE).

    Manufacturing Automation, Control, and Engineering Economics:

CNC machine-tools;
Metrology;
CAD/CAM systems and NC programs;
Programmable logic control;
Closed-loop computer control;
Statistical process control;
Design of experiments;
Time value of money;
Manufacturing system integration