

**Syllabus:                    PKG 4011 – Packaging Production & Processing**

Credits:                    3

Meeting Times:           MWF 9:35-10:25 AM

Office Hours:            MWF 2:00-3:00 PM

Instructor:                Bruce A. Welt Ph.D.  
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**General Description:** Study of operation and performance of modern packaging lines. Topics include equipment selection and specification, assessing and improving operating performance, process control and instrumentation.

**Objectives:** After successful completion of this course the student will be able to:

1. Identify and research packaging machines, machine manufacturing companies and packaging industry associations.
2. Identify unit operations that comprise common packaging lines.
3. Specify operating requirements of individual packaging machines in order to allow groups of packaging machines to function as a coherent system.
4. Apply time-value-of money concepts to make capital investment decisions.
5. Understand the relationships between products, packages, machines, and personnel.
6. Describe the roles of various professionals that interact with modern packaging operations including professionals involved in sales, marketing, engineering, product development, process development, management, etc.
7. Contribute to the productivity of packaging operations involved in various markets including bottling, folding cartons, rigid packaging, flexible packaging, product handling and quality control/assurance.

**Text:** Davis, C.G. *Introduction to Packaging Machinery*. Packaging Machinery Manufacturers Institute, Arlington, VA. 1997 (draft).

**Grading:**

2 Exams	100 Points Each
Homework/Quizzes	100 Points (Average of all assignments)
Final Exam/Project	100 Points

All exams and homework assignments will be graded on a scale from 0 to 100. An automatic 10% per week penalty will be assessed to work turned in passed the due date. Final grades will be computed from the percentage of points earned relative to the total points possible. Grades will be assigned as follows:

A  $\geq$  90%  
85  $\leq$  B+ < 90  
80  $\leq$  B < 85  
75  $\leq$  C+ < 80  
70  $\leq$  C < 75  
65  $\leq$  D+ < 70  
60  $\leq$  D < 65  
E < 60

**Recommended Reading:**

Brody, A.L. and Marsh, K.S. 1997. *The Wiley Encyclopedia of Packaging Technology*, Second Edition. John Wiley & Sons, Inc. New York, NY.

Luciano, R. 1995. *How to Write Packaging Machinery Specifications*. Institute of Packaging Professionals, Herndon, VA.

Pyzdek, T. 2001. *The Six Sigma handbook*. McGraw-Hill, NY.

Soroka, W. 1999. *Fundamentals of Packaging Technology*, Institute of Packaging Professionals, Herndon, VA.

Zepf, P.J. 1996. *Improving Packaging Line Performance*. Institute of Packaging Professionals, Herndon, VA.

## Course Outline:

- I. Overview of Packaging Lines
- II. Machinery
  - a. Bottling Machinery
  - b. Folding Carton Machinery
  - c. Labeling
  - d. Case Packaging Machinery
  - e. Palletizing and depalletizing
  - f. Form-Fill-Sealing
  - g. Conveyors, accumulators and unscramblers
  - h. Coding and marking
  - i. Scales and check weighing
- III. Machine Specification
- IV. Techniques for measuring line capacity and efficiency
- V. Capital investment economics
- VI. Approaches to improve quality
  - a. TQM
  - b. SPC
  - c. Six-sigma
- VII. Process control
  - a. Motors and motor controllers
  - b. Programmable Logic Controllers
  - c. PI D control

**Academic Honesty:** As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty, and understand that my failure to comply with this commitment may result in disciplinary action, up to and including expulsion from the university."

**Software Use:** All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Such violations are also against University policies and rules, and disciplinary action will be taken as appropriate.

**University of Florida Counseling Services:** Resources are available on campus for students having problems or lacking clear career and academic goals that interfere with their academic performance. These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling.
2. Student Mental Health, Student Health Care Center, 392-1171, for personal counseling.
3. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, for sexual assault counseling.
4. Career Resource Center, Reitz Union, 392-1601, career development