1. Catalog Description

(a) Course number: AET 4863
(b) Title: Packaging Design
(c) Meeting times and Credit: 2-2-3
(d) Term(s) to be offered: On-Demand
(e) Short title: Package Design
(f) Course description: Detailed study of the practical applications of package design for specific products including membrane switches, and theory of Radio Frequency Identification (RFID) printing processes. Specialty inks and coatings such as conductive inks, UV inks, food-grade inks, and microencapsulated inks will be explored.

(g) Prerequisite: None.
(h) Initial term: Summer 2007

2. Student Learning Objectives and Evaluation

(a) Learning Objectives:
Undergraduate: Upon completion of this course students will:
1. identify the historical development of packaging, specialty inks, and coatings development
2. explain printing processes for packaging, membrane, and theory of RFID requirements
3. explain the various specialty inks and coating applications
4. demonstrate the fundamentals of design principles to produce a commercial package
5. demonstrate the application of designs applicable to specific packaging markets with the proper ink and substrate selection
6. demonstrate proper selection of specialty inks and coatings
7. design and produce commercially viable packages, membrane switches as a team, and the theory of RFID (Radio Frequency Identification)-enabled packaging
8. critically analyze peer prototype package designs

(b) Student evaluation: Undergraduate(U) & Graduate (G) students’ achievement of the stated objectives will be assessed and grades will be earned, based on activities such as individual and team projects, examinations and final projects evaluations.

- Objective 1: (identify the historical development of packaging, specialty inks, and coatings development) 20% U & G Analyzing Packaging, specialty inks and coatings,
- Objective 2: (explain printing processes for packaging, membrane switches, and theory of RFID requirements) 15 % U & G exams,
- **Objective 3**: (explain the various specialty inks and coating applications) 15% U & G exams,
- **Objective 4**: (demonstrate the fundamentals of design principles to produce a commercial package) 20% U & G Application of Packaging & Ink Labs,
- **Objective 5**: (demonstrate the application of designs applicable to specific packaging markets with the proper ink and substrate selection) 20% U & G Application of Packaging & Ink Labs, and 25% U & G Team Projects,
- **Objective 6**: (demonstrate proper selection of specialty inks and coatings) 20% U & G application of packaging & Ink labs, 25% U team projects & 20% G team projects
- **Objective 7**: (design and produce commercially viable packages, membrane switches, and theory of RFID-enabled packaging as a team) 25% U & G team projects and 20% U & G final packaging design presentation,
- **Objective 8**: (critically analyze peer prototype package designs) 25% U & G team projects and 20% U & G final packaging design presentation.

Students will be evaluated using the below categories as assigned above for each course objective.

<table>
<thead>
<tr>
<th>Category</th>
<th>Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyzing Packaging, specialty inks and coatings</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Exams</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>Application of Packaging &amp; Ink Labs</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Team Projects</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Final Packaging Design Presentation</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>Research Paper</td>
<td>10%</td>
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</tbody>
</table>

(c) This course will be delivered traditionally, with computer support, and web pages.

(d) Course number is AET 4863 for undergraduate and graduate students

1) Course objectives for graduate students:
   Research how printing guards against packaging tampering, counterfeiting, bioterrorism, and product adulteration. 10% G Research Paper
2) Projects for application and analysis:
   Research paper
3) Graduate students submit a research paper

(e) This course will be writing active, exams, packaging inks and coatings analysis, team projects, and final presentation will have writing components. Graduate students will write a research paper.
3. Outline of the Course
   (a) Specify units of time: The course will be offered in 2-2-3 format.

   Course Outline is as follows:
   I. Introduction to course & historical developments
      of packaging, specialty inks, and coatings 1 week
   II. Review of printing processes for packaging,
        membrane, specialty inks and theory of RFID requirements
        including security, tampering and theft proof devices 2 weeks
   III. Review and demonstrate the fundamentals of
        design principles to produce a commercial package 2 weeks
   IV. Review and demonstrate the application of designs
        applicable to specific packaging markets with the
        proper ink, substrate, and coatings selection using
        application software in laboratory assignments 3-4 weeks
   V. Design and produce commercially viable packaging,
      membrane switches, and theory of RFID-enabled packaging
      in a team setting 5-6 weeks
   VI. Analyze peer prototype package designs &
       review of graduate student research papers 1 week

   (b) Two (50 minute) lectures and two 50 lab minutes per week for 15 weeks.
       Additional open lab hours are available to complete individual lab projects
       and team projects.

4. Rationale
   (a) Purpose and Need:
      The proposed course will allow digital printing, imaging, and web technology and
      textile design students to have a course focused on packaging design, proper inks,
      coatings and substrate selection for the development of packaging, membrane
      switches, and the theory RFID indicators. Finally, students will be competent
      graduates in a competitive marketplace with other graduates from nationally
      recognized programs such as Clemson University, Western Michigan, University of
      Wisconsin at Stout, Michigan State University, in the application of packaging
      technologies.

   (b) Justification of the level of the course prerequisites: AET 1363 is the foundation
      course for the concentration which is a solid understanding and application of the
      principles, and procedures for digital printing and graphic communication printing
      processes and technologies. AET 3343 is a digital software application specific to
      layout and design applicable to print and packaging design. It is recommended that
      students enrolling in this senior level class have completed their scientific awareness
      general education requirements in physics and chemistry as required for the Applied
      Engineering & Technology major.
      This course will be open to juniors, seniors and graduate students.

   (c) Similarity to existing courses:
      There is no similarity to other courses.
(d) Impact on Program:

(1) This course will be offered as an elective course in the Digital Printing, Imaging, and Web Technology concentration and the Applied Engineering & Technology Degree.

(2) This course will be offered as an elective course for the Masters in School of Technology.

5. Implementation

(a) Implementation: Dr. Phil Age, School of Technology
(b) Additional Costs to Students: $45 lab fee
   Packaging an Introduction, Stanley Sacharow HBJ Publications (1986)

Reference Texts:

   How’d They Design and Print That?, Wayne Robinson, North Light Books, 1992
   Edition, 1985

6. Community College Transfer

   There is no community college course that is equivalent.

7. Date approved by the School of Technology Curriculum Committee: 10/27/05

8. Date approved by the Lumpkin College of Business & Applied Sciences Curriculum Committee 12/5/05

9. Date approved by CAA 1/26/05 CAA 2/21/06