

Dual-Listed Courses

Departments must request permission to offer courses at the graduate level in conjunction with 300-400 level undergraduate courses. The request is made to the Graduate Curriculum and Catalog Committee. If the dual-listed courses are also experimental courses (400X/500X), submit the experimental course form to the Scheduling Office, 10 Enrollment Services, AND attach an approved copy of the experimental course form(s) to the dual-listed request.

Dual-listed courses permit undergraduate and graduate students to be in the same class but to receive credit under two different course numbers. Credit in the graduate course is not available to students who have received credit in the corresponding undergraduate course. Both graduates and undergraduates receive the same amount of credit for the course, but additional work is required of all graduate students taking the course under the graduate-level course number. This extra work may take the form of additional reading, projects, examinations, or other assignments as determined by the instructor. The instructor must be a member of the Graduate Faculty or a Graduate Lecturer. Each dual-listed course is designated in the catalog with the phrase "Dual-listed with," although the student's official transcript of credits, both graduate and undergraduate, does not identify dual-listed courses as such. There is a limit to the number of dual-listed course credits that may be used to meet the requirement for an advanced degree. (For information about procedures for requesting permission to offer dual-listed courses, faculty should consult the *Graduate Faculty Handbook*.)

In reviewing proposals for dual-listed courses, this committee needs to understand the department's rationale for offering the course. When a department submits a request, an explanation should be given of the purpose served by the course and the criteria used by the department to determine if the course is suitable for dual-listing. Please submit the proposal in electronic form as a word attachment to grad_college@iastate.edu.

The following information should be included in the proposal:

1. Full catalog information for each course to be dual-listed, including the course numbers (or proposed course numbers), title, credits, semester offering (if applicable), prerequisites, and description. Dual-listed courses bear common numbers, e.g., 580 (480).

482x/582x Fundamentals of Packaging

The study of materials, design, processes, performance and safety of packaging. Applied experiences include: packaging design, fabrication and performance testing for packaged products.

Learning objectives for the course:

LO1: Students will develop a fundamental understanding of packaging materials and sources

while applying mathematical and scientific principles to plastics processes (material formulations, calculations, mixing of chemicals, etc.) Outcomes will be measured through objective testing and lab experiments.

LO2: Students will gain an understanding of economic factors pertaining to cost, materials, processes, and products in an international environment. Outcomes will be measured through objective testing and class project

2. Graduate faculty status of the proposed instructor.

Associate Professor. The faculty member has instructed graduate level course at his former university in packaging materials and processes.

3. Number of the dual-listed course credits the department will permit to be used to meet the requirements for an advanced degree. This limit includes dual-listed courses taken in all departments.

NA

4. The differential expectations for graduate students and undergraduates. What additional work will be required for graduate students enrolled in the course? Please describe this work, not in abstract terms (such as "more in-depth participation") but in terms of concrete measurable outcomes or other tangible evidence. Welcome inclusions: specific examples of the additional assignments with details about paper length; the number of additional readings; the length and frequency of oral presentations; portfolio expectations; indications of how these graduate requirements are weighted in the course grade (ex. 40% of final grade); comparisons with undergraduate expectations.

Examples:

- **Graduate students will participate in writing a grant proposal to private industry for funding.**
- **Graduate student will be required to use advanced analytical techniques to provide support when making a position on a case study.**
- **Graduate students will be required to identify, use and perform methods of analysis with limited instructor input to allow for the development of problem solving skills.**

Reason(s) the course is considered sufficiently rigorous and of such an advanced nature as to challenge graduate students.

The use of advanced analytical techniques for problem solving with respect to material selection is a very challenging endeavor. This will be part of the graduate curriculum. Data analysis and interpretation is necessary as part of the process and will be integrated.

5. Academic advantages and disadvantages accruing to graduate students taking this course with undergraduates.

Advantages: Access to undergraduate students for skills in translating research techniques and process to a broader audience with less experience. How to take complex methods and thoughts and make them accessible to a broader audience.

Disadvantage: Extra time will be needed to explain topics to undergraduates that might already be known by graduate students. Also, concerns with undergraduate lab practices that require more oversight. This will require more interaction and assistance of the instructor.

6. The place of the course in a graduate student's program of study and why it is not considered a "remedial" undertaking intended to overcome deficiencies in the student's preparation for graduate work.

The proposed course is new curriculum to the FSHN and the Iowa State University as a whole. Certainly not remedial with all concepts being new and unknown to the student population. Many topics require detailed training and discussion that is more readily suited to graduate students. The basics can be adopted by undergraduates and graduates but still considered new material as this has never been taught at ISU.

7. The role of the course in an undergraduate's degree program and the academic qualifications undergraduates must have to take this course.

Undergraduates in FSHN have little training in packaging and maximizing processes and ingredients to maintain freshness through utilization of the packaging materials or designing the packaging materials to maintain quality and freshness. This is a desperately needed and integral part of the FSHN curriculum that industry applied and driven. This provides another set of skills making FSHN students at ISU much more marketable and well-rounded in product development and understanding that without good packaging you will not have a good product.

8. The name of the person writing the proposal.

Keith Vorst, Associate Professor, FSHN

9. Results of Consultation from committee

GCCC reviewed the request for FSHN 482/582 and had these requests:

1. The Description for the undergraduate course and the graduate course needs to be exactly the same.

Change made as requested in current submission.

2. Check with other departments/programs about cross listing, such as Supply Chain Management and Industrial Design.

Collaboration with many departments across campus has been initiated and is on-going.

3. List the pre-requisites for the graduate courses, if any.

Course pre-requisites have been identified and currently listed in the syllabus and course catalog.

STAT 101, 104 or 105. Any exceptions need to be approved by instructor

4. Need more clarification about additional requirements for the graduate level course. There is nothing in the syllabus. What are advanced techniques?

Learning objectives and outcomes have been changed to reflect the additional requirements of advanced analytical techniques and material identification such as analysis of unknown and known packaging materials using spectroscopy. Final project/report for use of advanced analytical techniques (ICP, IR, ATR, DSC) to develop a full industry proposal for identification and use of novel packaging material.

Course Syllabus

Iowa State University
Food Science and Human Nutrition

FS HN 482X/582X Fundamentals of Packaging (3)

Instructor: Keith L. Vorst, Ph.D. Specialization in Packaging, Manufacturing and Food Safety
Office: **1541 Food Science Building** **Phone:** 515-294-6957
Email: kvorst@iastate.edu

Catalog Description:

The study of materials, design, processes, performance and safety of packaging. Applied experiences include: packaging design, fabrication and performance testing for packaged products.

Learning objectives for the course:

LO1: Students will develop a fundamental understanding of packaging materials and sources while applying advanced analytical techniques for identifying and characterizing packaging material.

Outcomes will be measured through objective testing and lab experiments.

LO2: Students will gain an understanding of economic factors pertaining to cost, materials, processes, and products in an international environment. **Outcomes** will be measured through objective testing and class project.

Required Text

Selke, Susan E.M., Cutler, John D., and Hernadez, Ruben J., (2004), **Plastics Packaging**, 2nd edition, Hanser Gardner Publications, Cincinnati, Ohio. ISBN # 1-56990-373-7.

Methods of Instruction

Lectures: Information on plastics and other materials used in the course. Lectures will be supplemented by the use of visual aids, outside reading, research, etc.

Demonstrations: Basic processes will be demonstrated in the lab.

Lab Activities: Lab activities covering packaging conversion and testing.
(Lab activities are a separate component of the class)

Evaluation Methods FS HN 482X

Lecture:

Exam I	15%
Exam II	15%
Exam III (Final)	15%
Participation (QOTW)	10%
Quizzes and Lecture Activities	15%

Final grade determination will be based on the following scale:

100 -- 93	A	69 - 67	D+
92- 90	A-	66- 63	D
89 - 87	B+	62- 60	D-
86 - 83	B	59- 0	F
82 - 80	B-		
79 - 77	C+		
76 - 73	C		
72 - 70	C-		

Lab:

10 Activities	20%
Lab Final	5%
(product and Material Characterization)	
Packaging Evaluation Report	5%

Week

Topics (Subject to change as necessary)

1. Course Overview
2. Consumer Communication, Marketing and Advertising
3. Functions and Design of Packaging
4. Selection of Materials (Paper, Metal)
5. Selection of Materials (Glass and Plastic)
6. **Exam 1**
7. Packaging Design and Simulation
8. Conversion Processes (injection molding, extrusion, blow molding)
9. Flexible Packaging Conversion (paper and plastic)
10. Package Testing (Part 1)
11. Package Testing (Part 2)
12. **Exam 2**
13. Permeability and Shelf-Life
14. Analytical Analysis of Packaging
15. Group Project Evaluation
16. Group Presentations – Lab Exam
17. **Final Exam**

Attendance Policy:

You are expected to attend all classes and laboratories. Students are responsible for all lecture and laboratory material that has been covered for examinations.

Evaluation Methods – FS HN 582X

Lecture:

Exam I	15%
Exam II	15%
Research Proposal	15%

Final grade determination will be based on the following scale:

Lab:

5 Activities	20%
Lab Final (Material Characterization)	15%
Packaging System Report	10%
Experimental design, execution and report	10%

100 -- 93	A	69 - 67	D+
92- 90	A-	66- 63	D
89 - 87	B+	62- 60	D-
86 - 83	B	59- 0	F
82 - 80	B-		
79 - 77	C+		
76 - 73	C		
72 - 70	C-		

Week

Topics (Subject to change as necessary)

2.	Course Overview
	Consumer Communication, Marketing and Advertising
17.	Functions and Design of Packaging
18.	Selection of Materials (Paper, Metal)
19.	Selection of Materials (Glass and Plastic)
20.	Exam 1
21.	Packaging Design and Simulation
22.	Conversion Processes (injection molding, extrusion, blow molding)
23.	Flexible Packaging Conversion (paper and plastic)
24.	Package Testing (Part 1)
25.	Package Testing (Part 2)
26.	Exam 2
27.	Permeability and Shelf-Life
28.	Analysis of known and unknown packaging materials
29.	Packaging system project for performance and characterization
30.	Report on analytical methods for packaging system, material identification, and application
31.	Final Exam

Attendance Policy:

You are expected to attend all classes and laboratories. Students are responsible for all lecture and laboratory material that has been covered for examinations.

Academic Honesty Policy: The instructor adheres to the academic honesty as described in the 2015-2016 Iowa State University catalog.

Students with Disabilities: Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. All students requesting accommodations are required to meet with staff in Student Disability Resources (SDR) to establish eligibility. A Student Academic Accommodation Request (SAAR) form will be provided to eligible students. The provision of reasonable accommodations in this course will be arranged after timely delivery of the SAAR form to the instructor. Students are encouraged to deliver completed SAAR forms as early in the semester as possible. SDR, a unit in the Dean of Students Office, is located in room 1076, Student Services Building or online at www.dso.iastate.edu/dr/. Contact SDR by e-mail at disabilityresources@iastate.edu or by phone at 515-294-7220 for additional information.

Religious Accommodation Statement: Iowa State University welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic or work requirement conflicts with religious observances and practices. If that happens, students and employees may request reasonable accommodation of their religious practices. In all cases, you must put your request in writing. The instructor or supervisor will review the situation in an effort to provide a reasonable accommodation when possible to do so without fundamentally altering a course or creating an undue burden for the instructor, supervisor, or department.

Harassment Policy: Iowa State University is committed to assuring that its programs are free from prohibited discrimination and harassment based upon race, ethnicity, sex, pregnancy, color, religion, national origin, physical or mental disability, age (40 and over), marital status, sexual orientation, gender identity, genetic information, status as a U.S. veteran (disabled, Vietnam, or other), or any other status protected by university policy or local, state, or federal law. Discrimination and harassment impede the realization of the university's mission of distinction in education, scholarship, and service, and diminish the whole community.

Iowa State University reaffirms and emphasizes its commitment to provide a professional working and learning environment that is fair and responsible; that supports, nurtures, and rewards educational and employment growth on the basis of relevant factors such as ability and performance; and that is free of discriminatory, inappropriate, and disrespectful conduct or communication.

For these reasons, the university will not tolerate discrimination or harassment, as defined below, and is committed to preventing it or stopping it whenever it may occur at the university or in its programs. The policy presented here applies to employees, students, visitors, applicants, or program participants at Iowa State University. Students, however, should see the policy on *Sexual Misconduct, Sexual Assault, and Sexual Harassment Involving Students* for specific information regarding their unique rights and responsibilities, including resources and complaint resolution <http://www.policy.iastate.edu/policy/discrimination/#Statement>.

Dead Week Policy: For each Fall and Spring semester, the last full week of classes before final examinations is designated as Dead Week. The intent of this policy is to establish a one-week period of substantial and predictable study time for undergraduate students. During the Dead Week period, regular lectures are expected to continue, including the introduction of new content, as deemed appropriate by the instructor. The restrictions established by this Dead Week policy are:

- Due dates for mandatory graded submissions of any kind that fall within Dead Week must be listed on the syllabus provided at the start of the course.
- Mandatory final examinations may not be given during the Dead Week period except for laboratory courses or courses that meet weekly and for which there is no contact during the normal final examination week.
- Recognized ISU Student Organizations may not hold any meetings, functions, or sponsored events during the Dead Week period. Any exception to these restrictions must be authorized in advance by the Director of Student Activities.