Food Packaging – FDSCTE 5450

Call number 19207
Spring Semester, 2020
Syllabus

Objectives: Upon completion of this course, students will:

(1) be able to comfortably discuss packaging related issues such as materials selection, forming techniques and packaging sealing with a packaging engineer;
(2) know how food packaging is manufactured;
(3) understand the material properties of various packaging raw materials as well as the final package;
(4) understand the principal methods of packaging foods as well as criteria for selecting and testing packaging materials;
(5) have familiarity with packaging equipment and methods,
(6) have discussed recent advances in food packaging techniques and systems.

Credits:	3
Instructor:	Dr. Melvin Pascall
Office:	225 Parker Hall
Telephone number:	614-292-0287
E-mail:	pascall.1@osu.edu
Lectures	1:50 to 2:45 pm - M, W
Laboratory	12:45 to 3:40 pm - Th
Office Hours:	MW 11:30 am to 1:30 pm (by appointment)
Meeting Place:	114 Parker M,W,Th

Course Description:

This course covers three areas pertaining to food packaging materials and methods: materials, systems, and applications. The course will begin by reviewing current trends in food packaging then it flows into the properties, fabrication and function of metal, glass, paper and plastic packaging. Packaging systems and equipment will include sanitation of materials, forming, filling, joining and enclosure operations, and related equipment. Selected topics for food packaging applications will include aseptic packaging, package/product interactions, closure integrity, modified atmosphere and active packaging, shelf life studies, handling and cushioning of packaged products. Laboratory exercises and field trips will complement the classroom lectures.

Grading System:

Labs/Plant Tour Reports (8) 25%, Midterm Exams: (2) 50%, Quizzes: 5%, Presentation and Term Paper 20%.

Laboratory/Plant tours:

Each week after the first week, there will be laboratory exercises and/or plant tours to a packaging materials or equipment facility. Lab reports for the laboratory exercises will consist of a 4-page double space, 12 point, Times New Roman or Arial font type (do not use bold print) written document. It should contain the (I) Title, (ll) Objective, (III) Significance of the exercise to food industries, (IV) Methodology (if appropriate), (V) Observations or Results/discussions, (VI) Conclusions, (VII) Recommendations. A report on each plant tour is also required. The plant tour reports should be similar to the Lab reports but should be a minimum of 3 double spaced pages, with 1-inch margins on all four side of the paper. The Lab reports are due one week after they are assigned, or the experiment is complete. Similarly, reports on plant tours are due one week after the trip. A 10% reduction will be given for late reports.

Midterms:

Two midterm exams will be given, lasting one hour. This will be closed book – Monday February 17, 2020 and Wednesday April 15, 2020.

Final Exam:

A final makeup exam will be given on April 28, 2020 at 4:00 to 5:45 pm. This will be closed book and will cover subjects taught during the second half of the semester.

Presentation:

Students will be expected to individually prepare a written report discussing a packaging related topic, issue, or problem faced by the food industry or food packaging field. Topics must be cleared with the instructor by Thursday February13, 2020. Reports should be no less than 5 pages of written text. Supporting figures and graphics may be included but will not count towards the 5 pages. Reports are to be type written with the author's name and the report title on a title page. The title page and the list of references will not count as part of the 5 pages of text. All pages must be numbers. The paper is due on Wednesday, April 8, 2020. Students must also give an oral Power Point presentation of their work during class on April 13, 15 or 16, 2020. Presentations should last from 8-10 minutes and should be sent via email to the TA by April 12, 2020, so that they could be loaded into the computer in the classroom prior to the class time. A 10% reduction will be assessed for late hand-ins.

Grading Criteria relative to top student:

A	A-	B+	B	B-	C+	C	C-	D+	D	E
≥93%	90%	87%	83%	80%	76%	72%	68%	65%	57	below 54%

Academic Misconduct:

Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. Academic dishonesty includes, but is not limited to, cheating, plagiarism, fabrication of information or citations, facilitating acts of academic dishonesty by others, unauthorized prior possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. At the beginning of this course the instructor will make a statement clarifying the application of academic integrity to the course. Any suspected violation of the Code of Student Conduct will be forwarded to the Committee on Academic Misconduct. The following link will provide good examples of how quotations should be done in the term paper and laboratory reports: https://www.wikihow.com/Cite-a-Quote.

Disability Statement:

Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. Also, please contact the Office for Disability Services at 614-292-3307 in room 150 Pomerene Hall to coordinate reasonable accommodations if you have a documented disability.

Text Books:

1. *Food Packaging, principles and practice.* 2nd Ed. Gordon L Robertson. Marcel Dekker, Inc., New York, NY.
2. *Fundamentals of Packaging Technology.* Fifth edition. 2014. Soroka, W. Institute of Packaging Professionals, Naperville, IL.

References:

1. *Canned Foods: Principles of Thermal Process Control, Acidification and Container Closure Evaluation.* 7th edition. 2007. Weddig, L.M., Balestrini, C.G., Shafer, B.D. GMA Science and Education Foundation, Washington, DC.
2. *Wiley Encyclopedia of Packaging Technology,* Second Edition, 1997. Brody and Marsh, editors. John Wiley & Sons, Inc. New York, NY.
3. *Post-harvest Technologies of Fruits and Vegetables.2015.* Hosahalli, R. S. DEStech Publications, Inc. Lancaster, PA.

FDSCTE 5450
FOOD PACKAGING

Date 2020	Topic	Instructor	Location
	Wk1. Introduction to food packaging; Packaging materials		
1/6 M	Introduction to food packaging.	Pascall	PK 114
1/8 W	Introduction to food packaging.	Pascall	PK 114
1/9 Th	Plastic packaging	Pascall	PK 118
	WK2. Packaging Materials (chemistry, morphology and physical characteristics)		
1/13 M	Plastic packaging	Pascall	PK 114
1/15 W	Plastic packaging	Pascall	PK 114
1/16 Th	Laboratory Exercise #1 – (Plastic Packaging)	Pascall	PK 230C
	WK3. Packaging Materials (chemistry, morphology and physical characteristics)		
1/20 M	MLK Holiday (No class)		
1/22 W	Metal packaging	Pascall	PK 114
1/23 Th	Field Trip #1 (Plastic Fabrication) Plastic Suppliers, 2450 Marilyn Lane, Columbus, OH 43219	Pascall	
	WK4. Metal Packaging Fabrication, Closures and Integrity		
1/27 M	Metal packaging	Pascall	PK 114
1/29 W	Metal packaging	Litchfield	PK 114
1/30 Th	Laboratory Exercise #2 (Metal Packaging)	Pascall	HH 59
	WK5. Glass Packaging Fabrication, Closures and Integrity		
2/3 M	Glass packaging	Pascall	PK 114
2/5 W	Glass packaging	Pascall	PK 114
2/6Th	Food packaging demonstration #1. Quiz #1	Pascall	PK 118
	WK6. Closures		
2/10 M	Closures (including tamper evident and child resistant)	Pascall	PK 114
2/12 W	Review session Paper packaging	Pascall	PK 114
2/13 Th	Laboratory Exercise #3 (Glass Packaging)	Pascall	PK 114
	WK7. Paper Packaging		
2/17 M	**Midterm Examination #1**		PK 114
2/19 W	Paper and composite packaging	Pascall	PK 114
2/20 Th	Plant tour #2 (Metal Can Manufacturing) Ball Corporation, 2690 Charter St. Columbus, OH 42228	Pascall	
	WK8. Shelf life and Food Packaging		
2/24 M	Packaging/product interactions	Pascall	PK 114
2/26 W	Shelf life determination	Pascall	PK 114
2/27 Th	Problem solving exercises #1. Shelf life determination	Pascall	PK 118
	WK9. Shelf life and Food Packaging		
3/2 M	Shelf life determination	Pascall	PK 114
3/4 W	Gas permeability	Pascall	PK 114
3/5 Th	Plant tour #3 (Glass Container Manufacturing) Anchor Hockings, 519 North Pierce Ave., Lancaster, OH 43130	Pascall	
	Spring Break WK.		
3/9 M	No Classes		
3/11 W	No Classes		
3/12 Th	No Classes		

	WK10. Modified and Active Packaging		
3/16 M	Modified atmosphere packaging	Pascall	PK 114
3/18 W	Active packaging	Pascall	PK 114
3/19 Th	Problem solving exercises #2.	Pascall	PK 118
	WK11. Mass Transfer in Packaging		
3/23 M	Chemical migration and food safety (FDA regulations)	Pascall	PK 114
3/25 W	Chemical sorption and food quality	Pascall	PK 114
3/26 Th	Laboratory Exercise #4 – (Shelf Life Determination)	Pascall	PK 230C
	WK12. Product Cushioning and Safety		
3/30 M	Package filling machines	Pascall	PK 114
4/1 W	Aseptic packaging and retorting	Pascall	PK 114
4/2 Th	Plant tour #4 Anheuser-Busch, 700 Schrock Rd. Columbus, OH/Marzetti, 3838 Indianola Ave Columbus OH	Pascall	
	WK13. Packaging Printing and Course Review		
4/6 M	Package printing and color selections	Guess lect.	PK 114
4/8 W	Review session / Quiz #2	Pascall	PK 114
4/9 Th	Food packaging demonstration #2	Pascall	PK 118
	WK14. Oral presentations		
4/13 M	Oral presentations	Students	PK 114
4/15 W	**Midterm Examination #2**		PK 114
4/16 Th	Oral presentations	Students	PK 118
	Final Week		
4/20 M	Oral presentations	Students	PK 114
4/28 Tu	**Final Exam** (4:00PM – 5:45 PM)		PK 114