

Course Syllabus

1	Course title	Food Packaging
2	Course number	603712
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	
5	Program title	PhD in Food Science and Technology
6	Program code	032
7	Awarding institution	The University of Jordan
8	School	Agriculture
9	Department	Nutrition and Food Technology
10	Level of course	Graduate
11	Year of study and semester (s)	1 st semester
12	Final Qualification	PhD
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Date of production/revision	2020

16. Course Coordinator:

Office numbers, office hours, phone numbers, and email addresses should be listed.
 Prof. Ghadeer F. Mehyar, 11:00-12:00 Sunday, Tuesday and Thursday
 10:00-11:00 & 12:00 :14:00 Monday and Wednesday
 g.mehyar@ju.edu.jo

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.
 Non

18. Course Description:

The course deals with new concepts and technologies in food packaging such as the concept of active, intelligent and edible packaging, recyclable and sustainable packaging. Physical and mechanical properties of the traditional and new packaging such as tensile strength, elongation, toughness, brittleness and gas permeability will be studied and demonstrated.

19. Course aims and outcomes:

A- Aims:

1. Provide extensive and advanced information about food packaging.
2. Recognizing different types of packaging; traditional, active, intelligent, smart, edible, and biodegradable etc.
3. Understanding the mechanism of food preservation by using the packaging.
4. Introducing of food packaging new concepts such as recycling, regulation and environmental concerns.
5. Introducing the concept of development of new packages.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to

A. Knowledge and Understanding: Student is expected to

A1- Determine the meaning of food packaging.

A2- Correlate packaging type with food safety and shelf-life.

A3- Understand mechanisms of food spoilage mechanisms that can be controlled by food packaging.

A4- Understand different types and sources of different packaging.

A5- Be introduced to concept of reduction the use of food packing and environmental concerns.

B. Intellectual Analytical and Cognitive Skills: Student is expected to

B1- Differentiate between different types of packages.

B2- Learn analysis the importance of each packaging type to specific food.

B3- How to deal with used packages.

C. Subject-Specific Skills: Student is expected to

C1- Learn how to design new packaging.

C2- Determine effect of food storage/processing conditions on properties and functions of the packages.

D. Transferable Key Skills: Students is expected to

D1- Skills to identify different types of packages and their potential effect on foods.

D2- Skills to control occurrence of spoilage toxicity in foods and how to deal with that by using different packages.

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
1. Introduction to food packaging a. Basic concepts and terms b. Non edible and edible packages c. Packaging requirements of selected food items d. Legislation issues of food packaging and effect of packaging materials on the environment	3/ 4 weeks	Prof. Ghadeer Mehyar	A-1, A-2, A-4 B-1 D-1 to D-2	Exams & class participation	Ahvenainen R. (2003). Oles R. and Kirwan M. (2011).
2. Active packaging of foods a. Oxygen scavengers b. Carbon dioxide scavengers/emitters c. Humidity absorbers d. Ethylene scavengers e. Ethanol emitters f. Antimicrobial-agents releasers g. Flavor/odor absorbers and releasers e. Temperature control packaging	3/ 4 weeks	Prof. Ghadeer Mehyar	A-2, A-3, B-1, B-2, C-1, D-1, D-2	Exams & class participation	Cha, D. and Chinnan, M. S. (2004). Cho, S. Y., Lee, D. S. and Han, J. H. (2009). Daniel, L. and Zhao, Y. (2007). Embuscado ME, Kerry C. Hubber KC. (2009).
3. Intelligent packaging of foods a. Time-temperature indicators b. Gas and volatiles indicators c. Freshness indicators d. Radio frequency indicators	3/ 4 weeks	Prof. Ghadeer Mehyar	A-2, A-3, B-1, B-2, C-1, D-1, D-2	Exams & class participation	Kerry, J and Butler, P. (2008).
4. Mechanical properties of packaging materials a. Terms and concepts b. Factors affecting the mechanical properties c. Material's behavior	3/ 4 weeks	Prof. Ghadeer Mehyar	A-2, A-5, B-3, C-1, C-2, D-1	Exams & class participation	Mehyar, G. F., and Han, J. H. (2004). Daniel, L. and Zhao, Y. (2007).

under an applied stress d. Measuring mechanical properties of edible packaging materials-A case study						
5. Barrier properties of the packaging materials a. Terms and concepts b. Factors affecting the barrier properties c. Measuring barrier properties of edible packaging materials-A case study	3/ 6-7 th	Prof. Ghadeer Mehyar	A-2, A-3, B-2, C-1, C-2, D-2	Exams & class participation	Ahvenainen R. (2003). Oles R. and Kirwan M. (2011).	

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:
Lectures and student participation

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:
Students outcome grades
Students evolutions
Course evaluation

23. Course Policies:

A. Attendance policies:
In case if the absence exceeded 15%, the student will automatically will fail the course.

B- Absences from exams and handing in assignments on time:
Makeup exam will be assigned. Postponing the assignment delivery time could be provided.

C- Health and safety procedures:
Are instructed from the beginning of the course.

D- Honesty policy regarding cheating, plagiarism, misbehavior:
Withdrawal of the exam

E- Grading policy:
It is given to the students from the beginning of the course.

F- Available university services that support achievement in the course:
Labs are well equipped for this purpose.

24. Required equipment: (Facilities, Tools, Labs, Training....)

25. References:

Required book (s), assigned reading and audio-visuals:

- Ahvenainen R. (2003). Novel Food Packaging Techniques. CRC Press, Washington, DC.
- Brody, A. L, Zhuang, H and Han, J (2011) Modified Atmosphere Packaging for Fresh-Cut Fruits and Vegetables. Wiley-Balckwell, West Usse UK.
- Cha, D. and Chinnan, M. S. (2004). Biopolymer-Based antimicrobial packaging: A review. Critical Reviews in Food Science and Nutrition. 44: 223-237.
- Cho, S. Y., Lee, D. S. and Han, J. H. (2009). Antimicrobial packaging. The Wiley Encyclopedia of Packaging Technology. 1-9.
- Oles R. and Kirwan M. (2011). Food and Beverage Packaging Technology. 2nd edition. Wiley-Balckwell, West Usse UK.
- Kerry, J and Butler, P. (2008). Smart Packaging Technologies for Fast Moving Consumer Goods. JKohn Wiley & Sons, Ltd.
- Mehyar, G. F., and Han, J. H. (2004). Physical and mechanical properties of high-amylose rice and pea starch films as affected by relative humidity and plasticizer. Journal of Food Science. 69: E449-E454.

Recommended books, materials, and media:

- Daniel, L. and Zhao, Y. (2007). Innovations in the development and application of edible coatings for fresh and minimally processed fruits and vegetables. Comprehensive Reviews in Food Science and Food Safety, 6, 60-65.
- Embuscado ME, Kerry C. Hubber KC. (2009). Edible Films and Coatings for Food Applications. Springer Science + Business Media. LLC.
- Janjarasskul T , Krochta JM . (2010). Edible Packaging Materials. Annual Review of Food Science and Technology. 1 :415-448 .

26. Additional information:

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Name of Course Coordinator: -----Prof. Ghadeer F. Mehyar--Signature: ----- Date: 1st March 2020--

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----