



University of Puerto Rico
Mayagüez Campus
College of Agricultural Sciences
Food Science and Technology Program



OFFICIAL SYLLABUS

**ANTIMICROBIAL FOOD PACKAGING
CITA 6015**

Credit Hours: 3	Contact Hours: Three (3) hours of conference per week	
Prerequisites: Authorization of the Director	Co-requisites: NONE	
Course Description (English): State-of-the-art- packaging strategies aimed to inhibiting microbial growth in raw and processed foods from meats, fruits, vegetables, poultry, seafood and beverages. The use of natural antimicrobial agents, nanoparticles, biosensors, DNA arrays, MALDI-TOF spectrophotometry in applications of biodegradable packaging, films and antimicrobial coatings will be analyzed.		
Course Description (Spanish): Estrategias modernas de embalaje dirigidas a inhibir el crecimiento microbiano en alimentos crudos y procesados de carnes, frutas, vegetales, pollo, productos marinos y bebidas. Se analizará el usode agentes antimicrobiales naturales, nanopartículas, biosensores, arreglos de DNA, espectofotometría MALDI-TOF en aplicaciones de empaques biodegradables, láminas y coberturas antimicrobiales.		
Learning Objectives: At the end of the course the students will be able to:		
<ul style="list-style-type: none"> a. Analyze the science behind antimicrobial packaging and films reflecting advancements in chemistry, microbiology, and food science b. Apply up-to-date information on regulatory aspects, consumer acceptance and research trends. c. Relate and predicthe uses of natural and unnatural compounds for food safety and defense 		

Content Outline and Time Distribution:

<i>Topics to be covered</i>		<i>Contact hours</i>
I.	The Nature and Extent of Foodborne Disease in Packaged Food	3
II.	Packaging Material in the Food Industry	3
III.	Regulatory issues of Food Packaging	3
IV.	Control of Microbial Activity using Antimicrobial Packaging for meat, fruits, vegetables, poultry, seafood and beverages	5
V.	Detection of Foodborne Pathogens using biosensors, DNA arrays and MALDI-TOF mass spectrometry	5
VI.	Natural antimicrobials and applications in Food Packaging systems	5
VII.	Metal and Zinc Oxide Nanoparticules for Food Packaging Applications	5
VIII.	Antimicrobial Food Packaging based on Biodegradable Materials	5
IX.	Multifunctional Films, Coatings, Blends and Nanocomposites in Antimicrobial Food Packaging	5
X.	Combinational Approaches for Antimicrobial Food Packaging	6
XI.		
XII.		
XIII.		
XIV.		
<i>Total hours: (equivalent to course contact period)</i>		45.0

<i>Laboratories</i>		<i>Contact hours</i>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
<i>Total hours: (equivalent to laboratory contact period)</i>		0.0

Instructional Techniques:

- conference
discussion
computation
laboratory
seminar with formal presentation
seminar without formal presentation
workshop
art workshop
practice
trip
thesis
special problems
tutoring
research
others, please specify:

Learning Resources and Minimum Facilities Available or Required:

Classroom, projector, computer, blackboard

Evaluation Techniques and Relative Weight:

	Percent
<input checked="" type="checkbox"/> Exams (<u>25</u> % each)	75%
<input type="checkbox"/> Final exam	
<input type="checkbox"/> Short quizzes	
<input type="checkbox"/> Laboratory	
<input checked="" type="checkbox"/> Oral reports	15%
<input type="checkbox"/> Monographies	
<input type="checkbox"/> Portfolio	
<input type="checkbox"/> Journals	
<input checked="" type="checkbox"/> Projects	10%
<input type="checkbox"/> Others, specify:	
TOTAL: 100%	100%

Reasonable Accommodation (Law 51)

The University of Puerto Rico at Mayagüez (RUM) recognizes that each student has an inherited right to request reasonable accommodation according to Law 51: Law for Integral Educational Services for People with Disabilities. Every student has the right to receive reasonable accommodation if he/she presents the necessary evidence to be evaluated by the Office of Services to Students with Disabilities (OSEI-RUM), and the related information can be found at the following link: <https://www.uprm.edu/cms/index.php/page/85>. If your case is approved by OSEI-RUM, you will receive reasonable accommodation in your courses and evaluation, and you must contact each professor for course registered. For additional information contact OSEI-RUM at Sánchez Hidalgo 410 or via telephone 787-832-4040 extension 3107.

Academic Integrity:

The University of Puerto Rico promotes the highest standards of academic and scientific integrity. Article 6.2 of the UPR Students General Bylaws (Board of Trustees Certification 13, 2009-2010) states that academic dishonesty includes, but is not limited to: fraudulent actions; obtaining grades or academic degrees by false or fraudulent simulations; copying the whole or part of the academic work of another person; plagiarizing totally or partially the work of another person; copying all or part of another person answers to the questions of an oral or written exam by taking or getting someone else to take the exam on his/her behalf; as well as enabling and facilitating another person to perform the aforementioned behavior. Any of these behaviors will be subject to disciplinary action in accordance with the disciplinary procedure laid down in the UPR Students General Bylaws.

Policy Against Discrimination Based on Sex, Sexual Orientation, and Gender Identity:

The University of Puerto Rico prohibits discrimination based on sex, sexual orientation, and gender identity in any of its forms, including that of sexual harassment. According to the Institutional Policy Against Sexual Harassment at the University of Puerto Rico, Certification Num. 130, 2014-2015 from the Board of Governors, any student subjected to acts constituting sexual harassment, may turn to the Office of the Student Ombudsperson, the Office of the Dean of Students, and/or the Coordinator of the Office of Compliance with Title IX for an orientation and/or formal complaint.

Sexual Harassment: Certification 130-2014-2015 states:

Sexual harassment in the workplace and in the study environment is an illegal and discriminatory act and is against the best interests of the University of Puerto Rico. All persons who understand they have been subject to acts of sexual harassment at the University of Puerto Rico may file a complaint and request that the institution investigate, where necessary, and assume the corresponding action by the university authorities. If the complainant is a student, he or she must refer his or her complaint to the Office of the Student Ombudsperson or that of the Dean of Students.

Certification 06-43 of the Academic Senate states, "The academic guidelines for offering online courses," defines:

Traditional face-to-face courses are those that have less than 25% of the course's regular contact hours via the Internet. Therefore, a three-credit course will be considered "face to face" if, of the 45 hours of regular contact, 11 or less are taught via the Internet. According to certification 16-43 of the Academic Senate, a course may include up to 25% of its total contact hours via the Internet. The objective of this is so that all professors have this alternative in the case of any unscheduled eventuality.

Grading System:

Quantifiable (letters) Not Quantifiable

Standard Curve

100-90 A; <90-80 B; <80-70 C; <70-60 D; <60F

Bibliography:

Barros-Velázquez, J. (2016). Antimicrobial Food Packaging. Academic Press Elsevier. ISBN: 978-0-12-800723-5

Baldwin, E.A. (2012). Edible Coatings and Films to Improve Food Quality. CRC Press Taylor and Francis Group. ISBN: 978-1-4200-5962-5

Embuscado, M.E.; Huber, K.C. (2009). Edible Films and Coatings for Food Applications. Springer. ISBN: 978-0-387-92823-4

Cagri, A., Ustunol, Z., Ryser, E.T. (2004). Antimicrobial edible films and coatings. J Food Protection 67(4): 833-848.

Malhotra, B., Keshwani, A., Kharkwal, H. (2015). Antimicrobial food packaging: potential and pitfalls. Available at: <http://journal.frontiersin.org/article/10.3389/fmicb.2015.00611/full>

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Includes attachments:

Yes

No