



University of Puerto Rico
Mayagüez Campus
College of Agricultural Sciences
Department of Agricultural and Biosystems Engineering



OFFICIAL SYLLABUS

**AGRICULTURAL PRODUCTS PROCESSING
SAGA 4029**

| | |
|--|--|
| Credit Hours: 3 | Contact Hours: Two (2) hours conference and a laboratory period of three (3) hours per week. |
| Prerequisites: FISI 3091 or FISI 3151 or FISI 3171 | Co-requisites: None |
| Course Description (English): Unit operations, equipment, techniques, and processes used in handling and preparation of farm products for marketing, utilization and storage. | |
| Course Description (Spanish): Operaciones unitarias, equipos, técnicas y procesos empleados en la preparación de los productos de la finca, para fines de su mercadeo, utilización o almacenamiento. | |
| Learning Objectives: At the end of the course the students will be able to: a. learn the principles and practices of processing agricultural products. b. solve the kinds of problems that are generally encountered in an engineering curriculum after much longer preparation. | |

Content Outline and Time Distribution:

| <i>Topics to be covered</i> | | <i>Contact hours</i> |
|---|--|----------------------|
| I. | Course Introduction | 1 |
| II. | Review | 1 |
| III. | Fluid Flow | 3 |
| IV. | Energy | 2 |
| V. | Heat Transfer | 2 |
| VI. | Aseptic Processing and Packaging | 3 |
| VII. | Thermal Processing | 1 |
| VIII. | Refrigeration | 3 |
| IX. | Food Freezing | 2 |
| X. | Evaporation | 1 |
| XI. | Psychrometrics | 3 |
| XII. | Mass Transfer | 4 |
| XIII. | Food Dehydration | 3 |
| XIV. | Current Trends in the Food Processing Industry | 1 |
| XV. | | |
| XVI. | | |
| XVII. | | |
| XVIII. | | |
| <i>Total hours: (equivalent to course contact period)</i> | | 30 |

| <i>Laboratories</i> | | <i>Contact hours</i> |
|---|--|----------------------|
| 1. | Lab introduction and review | 3 |
| 2. | Units, functions and data presentation Heat Index Calculation | 3 |
| 3. | Health Safety and Introduction to Hazard Analysis Critical Control Points (HACCP) | 3 |
| 4. | Good Manufacturing Practices (GMPs), Sanitation Standard Operating Procedures (SSOPs) | 3 |
| 5. | QUIZ | 6 |
| 6. | Mass and energy balances | 3 |
| 7. | HACCP training: An example | 3 |
| 8. | Field trip | 6 |
| 9. | Drying time determination | 3 |
| 10. | Using a psychrometric chart | 3 |
| 11. | Non-newtonian viscosity example, ph determination, chlorine concentration determination, and thermometer calibration | 3 |
| 12. | Special reports | 6 |
| 13. | | |
| 14. | | |
| 15. | | |
| <i>Total hours: (equivalent to laboratory contact period)</i> | | 45 |

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:

The course will be taught in a traditional classroom. Equipment such as transparencies and head projector will be used in lectures. The computer room will be used in some of the laboratories. General Library and University Computer Center is available to obtain professor’s reference materials.

This course will required the following text book: Singh, R. Paul and Heldman, Dennis. 2001. *Introduction to Food Engineering* Third Edition San Diego, California: Academic Press. Handouts will be used in the laboratory

Internet access will be needed and is available in the Department. Presentations will be done in power point, which is also available in the Department.

Evaluation Techniques and Relative Weight:

| | Percent |
|--|----------------|
| <input checked="" type="checkbox"/> 2 Exams (20% each) | 40 |
| <input checked="" type="checkbox"/> Final exam | 20 |
| <input type="checkbox"/> Short quizzes | |
| <input checked="" type="checkbox"/> Laboratory | 20 |
| <input type="checkbox"/> Oral reports | |
| <input type="checkbox"/> Monographies | |
| <input type="checkbox"/> Portfolio | |
| <input type="checkbox"/> Journals | |
| <input type="checkbox"/> Projects | |
| <input checked="" type="checkbox"/> Others, specify: Class Participation | 20 |
| | |
| | |
| TOTAL: 100% | 100% |

Grading System:

Quantifiable (letters) Not Quantifiable

Standard Curve: 90 to 100 A; 80 < 90 B; 70 < 80 C; 60 < 70 D; 0 < 60 F

Bibliography:

Introduction to Food Engineering, Singh, R. Paul and Heldman, Dennis. 2001
Third Edition. San Diego, California: Academic Press.

Experimental Methods in Food Engineering, Syed S.H. Rizvi and Gauri S. Mittal. 1992
Van Nostrand Reinhold

Math Concepts for Food Engineering, R.W. Hartel, T.A. Howell, and D.B. Hyslop. 1992
Technomic Publishing Co., Inc.

Transport Processes and Unit Operations, Christie Geankoplis. 1978
Allyn and Bacon, Inc.

Food Engineering Fundamentals, J. Clair Batty and Steven I. Folkman. 1983
University Microfilms International

According to Law 51:

Law 51: The Comprehensive Educational Services Act for People with disabilities states that after identifying with the instructor and the institution, the student with disabilities will receive reasonable accommodation in their courses and evaluations. For more information contact the Department of Counseling and Psychological services at the Office of the Dean of Students (Office DE 21) or call 787-265-3864 or 787-832-4040 x 3772, 2040 and 3864.

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.

Includes attachments:

Yes

No