



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



OFFICIAL SYLLABUS

**EQUIPMENT FOR APPLICATION OF CHEMICAL AND BIOLOGICAL PRODUCTS
SAGA 5005**

Credit Hours: 3	Contact Hours: Two (2) hours conference and a laboratory period of three (3) hours per week
Prerequisites: TMAG 4015 or SAGA 4015 or authorization of the Director of the Department	Co-requisites: None
Course Description (English): Study of techniques and equipment used for the application of chemical and biological products in agriculture.	
Course Description (Spanish): Estudio detallado de las técnicas y equipos modernos para la aplicación de pesticidas y otros compuestos químicos a la agricultura.	
Learning Objectives: At the end of the course the students will be able to: a. Understand the principles and characteristics of commonly used techniques and equipment for agricultural chemical application work. b. Understand the use of different agricultural chemical application equipment correctly, including equipment selection, calibration, and safety precautions.	

Content Outline and Time Distribution:

<i>Topics to be covered</i>		<i>Contact hours</i>
I.	Introduction	1
II.	The role of chemical controls	2
III.	Safety precautions	2
IV.	Fertilizers: Chemical vs. Natural	1
V.	Safety precautions	2
VI.	Chemical application equipment i. Fertilizer applicators ii. Weed control methods, and application equipment iii. Applicators of liquid chemicals	6
VII.	Sprayers i. Hand-operated hydraulic sprayers ii. Power operated hydraulic sprayers iii. Electrostatic ally charged sprayers iv. Air assisted sprayers	6
VIII.	Formulations, calibrations and solution preparation	6
IX.	Maintenance of equipment	2
X.	Selection of spraying equipment	2
<i>Total hours: (equivalent to course contact period)</i>		30

<i>Laboratories</i>		<i>Contact hours</i>
1.	Hand operated sprayers	3
2.	Power operated hydraulic sprayer	3
3.	Calibration of sprayers	3
4.	Using web site for search of information on chemical applicators	6
5.	Invited speaker with the field experience	6
6.	Calculations of preparation of different dilutions	6
7.	Slide show on work in Germany on smart sprayers	6
8.	Slide show on calibration of hydraulic sprayers	6
9.	Tests	6
10.		
11.		
12.		
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:

This course is designed to deal with further study of agricultural machinery and their power relation. Hand-on experience and maintenance program for some equipment in AM lab will be observed and practiced. Heavy equipment that is not available in the lab will be covered through the scheduled field trips during the semester. There will be some laboratory sessions where only calculations of performance and calibration will be discussed.

Evaluation Techniques and Relative Weight:

	Percent
<input checked="" type="checkbox"/> 2 Exams (25% each)	50
<input checked="" type="checkbox"/> Final exam	25
<input type="checkbox"/> Short quizzes	
<input checked="" type="checkbox"/> Laboratory	25
<input type="checkbox"/> Oral reports	
<input type="checkbox"/> Monographies	
<input type="checkbox"/> Portfolio	
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:

Pesticide application methods. G.A. Matthews. New York. John Wiley, 1992.

Agro-pesticide: Their management and application. Jan Oudejans. United Nations, 1983

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