



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



COURSE SYLLABUS

GENERAL INFORMATION:

COURSE TITLE:	Electrotechnology
COURSE NUMBERING:	SAGA 4505
CONTACT HOURS /CREDITS:	45 hours / Three credits
PREREQUISITES, COREQUISITES AND OTHER REQUIREMENTS:	Prerequisite: MATE3049 or MATE3031 or MATE3021

COURSE DESCRIPTION:

ENGLISH: Fundamentals of the usage of electric materials for the application of electrical energy in agricultural systems and housing. A project is required for the planning and execution of an electrical installation. This course is offered in person.

SPANISH: Fundamentos de la utilización de materiales eléctricos para la aplicación de la energía eléctrica en sistemas agrícolas y vivienda. Se requiere un proyecto relacionado con la planificación y ejecución de una instalación eléctrica. Curso presencial.

LEARNING OBJECTIVES:

At the end of the course students will be able to:

- Define and explain terms, mathematical relations, and concepts related to the use of electric energy.
- Select electrical equipment and materials based on systems loads and relevant specifications.
- Recommend the type and capacity of auxiliary power generators based on client needs and the loads to be supported.
- Perform basic electrical connections such as installing single pole, 3-way, and 4-way switches, outlets, motors, breakers, and lighting systems.

SUGGESTED TEXTBOOK:

Hartwell, F.P. 2022. Wiring Simplified: Based on the 2020 National Electrical Code. Park Publishing. Forty-six edition. ISBN-13: 978-0997905328

COURSE OUTLINE AND TIME DISTRIBUTION:

TOPIC	TIME DISTRIBUTION (HOURS)
I. Introduction to the Course	2
II. Mathematical Relations in Electrical Systems	2
III. Electrical Distribution Systems	3
IV. Distribution Panels	3
V. General Purpose Circuits	3
VI. Wiring Principles	3
VII. Exam #1	2
VIII. Lighting Systems	2
IX. 3-Way and 4-Way Switches	2
X. Residential Electrical Distribution	2
XI. Exam #2	2
XII. Specialized Circuits	3
XIII. Residential Service Entrance	2
XIV. Farm Service Entrance	2
XV. Exam #3	2
XVI. Service Entrance for Agricultural Buildings	2
XVII. Motor Circuits	3
XVIII. Auxiliary Power Generators	3
XIX. Final Exam	2
TOTAL HOURS	45 hours

INSTRUCTIONAL STRATEGIES:

Some of the following may be used:

<input checked="" type="checkbox"/> Lecture	<input checked="" type="checkbox"/> Project Based Learning
<input type="checkbox"/> Discussion	<input type="checkbox"/> Seminars or Workshops
<input type="checkbox"/> Cooperative Learning	<input checked="" type="checkbox"/> Problem Based Learning (PBL)
<input type="checkbox"/> Case Studies	<input type="checkbox"/> Flipped Classroom
<input type="checkbox"/> Lectures with Guest Speakers	

MINIMUM OR REQUIRED RESOURCES AVAILABLE:

RESOURCE	FACE-TO-FACE
Classroom or laboratory	Institution
Account in the institutional learning management platform (e.g. Moodle or Blackboard)	Institution

Institutional email account	Institution
Computer with high-speed internet access or mobile device with data service	Student
Programs or applications: word processor, spreadsheets, presentation editor	Student
Webcam or mobile with camera and microphone	Student
Integrated or external speakers	Student
Whiteboard	Institution
Digital projector	Institution

Other: For the execution of projects, students need to bring a multimeter and tools (flat and Phillips screwdrivers, pliers to bend and cut wires).

ASSESSMENT TECHNIQUES: (Examples of evaluation techniques)

Assessment Technique	Relative Weight
<input checked="" type="checkbox"/> Exams	30% (10% each)
<input checked="" type="checkbox"/> Assignments	20%
<input checked="" type="checkbox"/> Short quizzes	20%
<input checked="" type="checkbox"/> Projects (individual)	15%
<input checked="" type="checkbox"/> Final exam	15%
Total:	100%

Standard scale: 90 to 100 A; 80 < 90 B; 65 < 80 C; < 65 F

REASONABLE MODIFICATION (REASONABLE ACCOMMODATION):

The University of Puerto Rico (UPR) acknowledges the right of students with disabilities to an inclusive, equitable, and comparable post-secondary education. In accordance with its policy toward students with disabilities, based on federal and state legislation, every qualified student with disabilities is entitled to equal participation in those services, programs, and activities that are physically, mentally or sensorially natured and have thus substantially affected one or more major life activities, such as their area of post-secondary studies. They have the right to receive reasonable accommodation or modifications. If you require accommodation or reasonable modification in the course, you must inform the professor without the need to disclose your condition or diagnosis. Simultaneously, you should promptly request the Office of Services for Students with Disabilities (OSEI) of the unit or campus for your need for modification or reasonable accommodation.

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 the Office of the Dean of Students, DE 12, via telephone 787-832-4040 extensions 6734 or 6735, email: oseirum@uprm.edu, at the virtual office: <https://meet.google.com/yvd-nrqo-mor>, or join by telephone: (US)+1 475-558-0169 PIN: 814 895 818#.

ACADEMIC HONESTY:

The University of Puerto Rico promotes the highest standards of academic and scientific integrity. Section 6.2 of the UPR General Student Regulations (Certification No.13, 2009-2010, Board of Trustees) provides that academic dishonesty includes, but is not limited to: “fraudulent actions, obtaining grades or academic degrees by false or fraudulent simulations, copying all or part of another’s academic work, copying all or part of another’s answer to questions on an examination, taking or having another take any oral or written test or examination on behalf of another, and aiding or facilitating another person to engaging such conduct.” Any of these actions will be subject to disciplinary sanctions in accordance with the disciplinary procedure provided in the UPR General Student Regulations in force. To ensure the integrity and security of user data, all hybrid, distance-learning and online courses shall be offered through the institutional learning management platform or through tools required by the course, which uses secure connection and authentication protocols. The system authenticates the user identity using the username and password assigned through the student institutional account. The user is responsible for keeping secure, protecting, and not sharing their password with others.

POLICY AND PROCEDURES TO MANAGE SEX AND GENDER-BASED DISCRIMINATION AT THE UNIVERSITY OF PUERTO RICO:

The Policy and procedures to Manage Sex and Gender-Based Discrimination at the University of Puerto Rico, Certification No. 107 (2021-2022) of the Governing Board, certifies that the University of Puerto Rico, as an institution of higher learning and a workplace, safeguards the rights and offers a safe space for those who interact therein, whether they be students, employees, contractors, or visitors. It seeks to promote an environment that respects diversity and the rights of the university community. This policy provides a protocol for handling situations related to the following prohibited conduct in the workplace or in the academic setting: discrimination based on sex, gender, pregnancy, sexual harassment, sexual violence, domestic violence, dating, violence, and stalking.

CONTINGENCY PLAN IN CASE OF AN EMERGENCY OR INTERRUPTION OF CLASSES

In the event of an emergency or interruption of classes, the professor will contact the students through the institutional email or other available means to coordinate the continuity of the course.

The contingency plan must preserve the modality in which the course was created and programmed in the course offering.

Certification 23-29 of the Academic Senate establishes that a face-to-face course may have up to 25% of the hours at a distance and if necessary, this option may be used.

DIVERSITY, EQUITY, AND INCLUSION

The University of Puerto Rico is committed to establishing an environment that values diversity, promotes equity and equality, and aspires to the full inclusion of its entire university community. Courses will be offered in an inclusive and equitable environment, ensuring the participation of students with diverse backgrounds, experiences, and abilities. Thus, the University of Puerto Rico reiterates its dedication to upholding the principles of diversity, equity, and inclusion in its academic programs.

GRADING SYSTEM

Quantifiable (letters, A, B, C, D, F) Not Quantifiable (Pass, Fail)

BIBLIOGRAPHY:

- Byers, C. 2022. Ultimate Guide: Wiring. Creative Homeowner. 9th Updated Edition. ISBN-13: 978-1580115759
- Editors of Cool Springs Press. 2022. Black & Decker: The Complete Guide to Wiring. Cool Springs Press. 8th edition. ISBN-13: 978-0760371510
- Holzman, H.N. 2023. Modern Residential Wiring. Goodheart-Wilcox. Thirteenth edition. ISBN-13: 978-1685845223.
- Mullin, R.C., Simmons, P. & Vigstol, D. 2023. Electrical Wiring Residential. Cengage Learning. 21st edition. ISBN-13: 978-0357766965
- Zayats, Y. & Chorny, A. 2023. Practical Electrotechnology. ISBN-13: 978-1527526587.

Electronic references:

- NFPA. 2023. NFPA 70: National Electrical Code. <https://www.nfpa.org/codes-and-standards/nfpa-70-standard-development/70>