

ARCE 320
Power System Engineering
Spring Semester

Catalog description: The main course objective is to introduce students to the requirements, analysis and design of electrical and power systems for commercial buildings. The course is provided in lecture format.

Course Credit – 3 Unit

Course Prerequisites: Engineering 211M

Instructor and Contact Information:

Specialized Architectural Engineering course taught by faculty or practicing engineer with expertise in this field.

Open-door policy by appointment with instructor

Course Format and Teaching Methods: Lecture.

Course Objectives and Expected Learning Outcomes

Course objectives: The main course objective is to provide a fundamental knowledge required for and design approaches for proper selection, specification, and installation of materials and equipment that comprise commercial electrical power systems.

Expected Learning Outcomes:

Students will be able to:

- Understand the scope of the electrical/power system within buildings
- Design these systems with recognition of appropriate codes and standards
- Recognize the interdependence among the architectural, electrical, mechanical and structural systems within a building system.

Absence and Class Participation Policy

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <https://deanofstudents.arizona.edu/absences>

Participating in course and attending lectures and other course events are vital to the learning process. As such, attendance is required at all lectures and discussion section meetings. Students who miss class due to illness or emergency are required to bring

documentation from their healthcare provider or other relevant, professional third parties. Failure to submit third-party documentation will result in unexcused absences.

Required Texts or Readings

Text will be required and TBD. D2L will be the primary means of distributing other class material.

Semester Schedule

43 lectures with 2 exams, led by instructor with occasional guest lecturer covering topics listed below.

Final Examination or Project

The date and time of the final exam or project, along with links to the Final Exam Regulations <https://www.registrar.arizona.edu/courses/final-examination-regulations-and-information>, and Final Exam Schedule, <http://www.registrar.arizona.edu/schedules/finals.htm>

Grading Scale and Policies

Item	Percent Each	Percent All
In-class exams (2)	17.5%	35%
Final exam (1)	25%	25%
Homework (10)	2%	20%
Design projects (3)	6.67%	20%
Total:		100%

Grading scale: A = 90-100%; B = 80-90%; C = 70-80%; D= 60-70%; E < 60%

University policy regarding grades and grading systems is available at, <http://catalog.arizona.edu/policy/grades-and-grading-system>

Requests for incompletes (I) and withdrawal (W)

Must be made in accordance with University policies that are available at <http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete> and <http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal> respectively.

Scheduled Topics/Activities

- 1) Basic design of interior and exterior building electrical systems including circuit design, power distribution and service equipment.
- 2) Understanding purpose and design of basic concepts and components of building electrical distribution systems, including circuit design, service entrance design, distribution system layout and reliability, emergency and standby power system design, medium-voltage distribution systems design, and special equipment and occupancies.
- 3) Proper selection, specification, and installation methods for materials and equipment that comprise commercial power systems.
- 4) Introduction to modeling of power systems and the calculations necessary to

- demonstrate compliance with applicable building codes and standards, including load calculations, voltage drop calculations, symmetrical fault current calculations, and coordination of overcurrent protective devices.
- 5) Evaluation of alternative power systems including renewable sources.
 - 6) Application of materials and equipment in accordance with industry standards, independent laboratory testing, and the National Electrical Code (NFPA 70 (NEC)) and other related building codes.
 - 7) Introduction to how the power system is designed in coordination with the disciplines of architecture, civil engineering, structural engineering, mechanical/plumbing engineering, economics, and construction.

Classroom Behavior Policy

Use of cell phone and mobile devices is not permitted in class. Computers can be used to take notes and during tutorial sessions

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (i.e. texting, chatting, reading a newspaper, making phone calls, web surfing, etc).

Students are asked to refrain from disruptive conversations with people sitting around them during lecture. Students observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to one's self. See: <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>

Accessibility and Accommodations

Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact Disability Resources (520-621-3268) to establish reasonable accommodations. For additional information on Disability Resources and reasonable accommodations, please visit <http://drc.arizona.edu/>.

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. Academic dishonesty will not be tolerated. Those committing violations of the academic integrity risk at a minimum failure of the assignment and the course. See:

<http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>

The University Libraries have some excellent tips for avoiding plagiarism available at:

<http://new.library.arizona.edu/research/citing/plagiarism>.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA email to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student email addresses. This conduct may also constitute copyright infringement.

UA Nondiscrimination and Anti-harassment Policy

The University is committed to creating and maintaining an environment free of discrimination, <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

Additional Resources for Students

UA Academic policies and procedures are available at:

<http://catalog.arizona.edu/policies>

Student Assistance and Advocacy information is available at:

<http://deanofstudents.arizona.edu/student-assistance/students/student-assistance>

Subject to Change Statement

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.