

Electricity and Electronic Applications – ASM 354
Agricultural Systems Management
Class #23547

Fall, 2024

3 credits

Lecture: 11:00 – 11:50 am., M & W (Peltier Complex RM 1200)

Clairmont Clementson, PhD.

Laboratory: 2:00 – 4:50 pm, Tu (LADD 318)

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Office hours: 12:00-1:00 pm, W (Peltier Complex Rm 3108D)

Title: Electricity and Electronic Applications. [Fundamentals and applications of electricity, power distribution, controls, motors, and solid-state electronics.]

PreReq: Math 103 or 104 or higher.

Text: - Fundamentals of Electricity in Agriculture, Gustafson and Morgan, 3rd edition 2004

- Agricultural Wiring Handbook, 16th edition

- Electricity for Agricultural Applications, Bern and Olson, 1st edition 2002

Learning Objectives: Expected outcomes for students are:

- 1) Review basic electrical principles
- 2) Appraise basic electrical wiring
- 3) Examine power distribution
- 4) Plan an electrical system for farmstead
- 5) Understand motors, controls, lighting, and solid-state electronics
- 6) Review basics of solar and wind power
- 7) Illustrate national electric codes.

Modes of Presentation:

Lecture with Power Point, Guest Speakers (possible)

Problem solving and Laboratory demonstrations

Blackboard will be used for announcements, quizzes, Application tasks, presentations repository, submissions placement, and grade register

Tentative Lab Schedule: Actual dates and material may vary. Changes will be communicated ahead of time.

Week	Date	Laboratory Topic
1	27-Aug	No Lab
2	3-Sept	Introduction to lab group/VOM/Amp probe/Circuit tester usage and test equipment
3	10-Sept	Big Iron
4	17-Sept	Wiring /electrical problems in the lab
5	24-Sept	Three-Phase
6	1-Oct	Wiring I
7	8-Oct	Demonstration panel
8	15-Oct	Service entrance
9	22-Oct	Wiring II
10	29-Oct	Magnetic starters/controls/switches/Sensors
11	5-Nov	Wiring and conductor sizing/Overload protection-Fuses/Circuit breakers/GFCI
12	12-Nov	Circuitry
13	19-Nov	Sensors/PLC's
14	26-Nov	Alternates
15	3-Dec	
16	10-Dec	Dead week NO LAB

Tentative Lecture Schedule: Actual dates and material may vary. Changes will be communicated ahead of time.

Week	Date	Topic	Chapter & Section		Problems
			FEA	AWH	
1	Aug. 28	Introduction			
2	Sept. 2	Holiday- Labor Day			
	Sept. 4	Basic terms and definitions	1		3,4,5,6,7,8,
3	Sept. 9	Basic terms and definitions	1		10,14,15,17
	Sept. 11	Resistive Networks	2		3(a,b,d,e) 5,8
4	Sept. 16	Inductance Capacitance Phase relations	3		1,8,10
	Sept. 18	Make your own quiz and Review #1			
5	Sept. 23	Assessment #1			
	Sept. 25	Power generation and distribution	4		1,3,4,9
6	Sept. 30	Planning the electrical distribution systems	5	16,18,19,20, 21,22,23,24, 30,31,32	1,3,4,5,6
	Oct. 2	Planning the electrical distribution systems	5		
7	Oct. 7	Planning the residential electrical distribution system	6	18,21,22	2,4,5,6
	Oct. 9	Planning the residential electrical distribution system	6		
8	Oct. 14	Direct electrical controls and devices	7	18,21,22	1,2,4,6,7
	Oct. 16	Make your own quiz and Review #2			
9	Oct. 21	Assessment #2			
	Oct. 23	Electric Motors	8	25,26,27	1,2,3,9,10
10	Oct. 28	Electric Motors	8		
	Oct. 30	Relay based controls/Solid State Electronics	9/16		1,4
11	Nov 4	Plc/Sensors	10		
	Nov. 6	Lighting	11		1,2
12	Nov. 11	Holiday – Veterans Day			
	Nov. 13	Make your own quiz and Review #3			
13	Nov. 18	Assessment #3			
	Nov. 20	Electric heat	12	12,13	1,2,3,4
14	Nov. 25	Solar and Wind	13	2	1,6,11(10 hr light/day)
	Nov. 27	Holiday Thanksgiving			
15	Dec 2	Lightning and Lightning protection	14	2	1
	Dec 4	Power quality and Stray voltage problems in Agriculture	17 – 18		
16	Dec. 9	Make your own quiz and Review #4			
	Dec. 11	Alternate			
	Dec. 18	Assessment #4; 8:00-10:00 AM			

Attendance: *Your attendance and full participation is expected*, through classroom discussions, volunteering answers to questions, asking appropriate questions, thoughtful evaluation of a team oral presentation, and by helping to create a spirit of cooperation within the class. **You are required to attend lab demonstrations and assessments in-person.**

Attendance Expectations Class attendance is expected in accordance with NDSU University Senate Policy 333: Class Attendance Policy and Procedure (<https://www.ndsu.edu/fileadmin/policy/333.pdf>). All class materials will be posted on the BB.

- Students are expected to attend every class lecture.

- Students are expected to attend the lab and three exams in person.
- While the late participation policy for this course is outlined below, there is flexibility regarding deadlines for students who are experiencing illness. However, I should be notified at the earliest opportunity.

Grading:

You will have Quizzes, Application Tasks, Laboratory Demonstrations, Discussion Board/MYO Reviews and Learning Assessments in the course. Your lowest quiz, Application Tasks and Learning Assessment scores will be dropped. Your final grade in the course will be determined by a grade percentage ranging from 0 to 100%. The weighted grade percentage will be computed as follows: 1) divide the total points earned in each work category by the total points possible for that grade category, 2) multiply the numbers from step (1) by the weight percentages for each respective grade category, and 3) add the results. The weighted grade percentage will be converted to a letter grade using the following straight grading scale. Raw scores will be posted on Blackboard for informational purposes only. You are encouraged to develop your own spreadsheet to estimate your course grade.

Item	Weighted % of total grade
Application Tasks	20%
Quizzes	10%
Laboratory Demonstrations	15%
Discussion Board/MYO Reviews	5%
Learning Assessments (#1 – 16%; #2 – 17%; #3 – 17%)	<u>50%</u>
Total	100%

The cut off for letter grades are: => 90% = A; =>80% = B; =>70% = C; =>60% = D

Learning Assessments, Application Tasks, Quizzes, Class Activities and Participation Policies:

Learning Assessments will be based on lectures, in-class discussions, Application Tasks, and Laboratory Demonstrations. The assessments will be a combinations of various question types, which may include short answers, problem-solving, multiple-choice, and rational, and fill in the blank questions, depending on what works best for the content covered. **All exams will be in-person @ Peltier Complex Room 1200.**

Application Tasks are a critical component in learning course concepts, as they provide students the opportunity to apply their knowledge and assess their understanding of the subject matter. These tasks are also meant to evaluate your comprehension, so it is in your best interest to keep up with the schedule. Application Tasks submitted late without the instructor's permission may incur a penalty of approximately 5% per day. Consult the instructor regarding maximum penalties. If you are sick, notify the course instructors as soon as possible to arrange accommodations. All solutions and calculations must be shown in an organized manner. Blackboard will be used for submission and grading.

Quizzes will be executed via Blackboard with set deadlines. The weekly module will indicate posting of quizzes.

Discussion Board, groups will be tasked with summarizing the weeks' lesson and respond to queries from colleagues on specific course content.

Laboratory Demonstration: Appropriate care should be taken when performing laboratory exercises. Laboratory reports will be due as scheduled. Reports are to be typed or legibly handwritten in ink. Marks will be deducted for illegible and/or hard-to-follow handwritten lab reports.

Academic Honesty

The academic community is operated on the basis of honesty, integrity, and fair play. [NDSU Policy 335: Code of Academic Responsibility and Conduct](#) applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the [Office of Registration and Records](#). Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.

Students with special requirements

Any students with disabilities who need accommodations in this course are invited to share these concerns or requests with the instructor and contact the [Center for Accessibility and Disability Resources](#) as soon as possible.

Veterans and military personnel

Veterans or military personnel with special circumstances or who are activated are encouraged to notify the instructor as early as possible and are encouraged to provide Activation Orders.

Family Educational Rights and Privacy Act (FERPA)

Your personally identifiable information and educational records as they relate to this course are subject to [FERPA](#).

Important Dates (Full NDSU dates/deadlines can be found [here](#))

Aug 26	Mon	Classes begin at 4:00 p.m.
Aug 27	Tue	First full day of classes
Sep 2	Mon	HOLIDAY — Labor Day (no classes, offices closed)
Sep 2	Mon	Last day to be added to Campus Connection Wait Lists
Sep 4	Wed	Last day to Add classes via Campus Connection* Permit needed after this date.
Sep 4	Wed	Last day for no-record Drop of classes @ 100% refund*(full semester classes only)
Sep 4	Wed	Last day to Withdraw to Zero Credits @ 100% refund*(full semester classes only)
Sep 10	Tue	Financial aid applied to NDSU account balances
Sep 11	Wed	Payments due for NDSU account balances
Oct 4	Fri	Last day to Withdraw to Zero Credits @ 75% refund*(full semester classes only).
Oct 15	Tue	Late fees applied to unpaid account balances (11:59 p.m.)
Oct 21	Mon	2nd half (8-week session) of Fall semester begins
Nov 3	Sun	Last day to Withdraw to Zero Credits @ 50% refund*(full semester classes only). No refunds issued for withdraw to zero credits after this date.
Nov 11	Mon	HOLIDAY — Veterans Day Observed (no classes, offices closed)
Nov 15	Fri	Last day to Drop classes with 'W' record
Nov 15	Fri	Last day to Withdraw to Zero Credits for Fall
Nov 15	Fri	Late fees applied to unpaid account balances (11:59 p.m.)
Nov 27-29	Wed-Fri	HOLIDAY — Thanksgiving (no classes; offices closed Thurs only)
Dec 9-13	Mon-Fri	Dead Week
Dec 13	Fri	Last day of Fall classes
Dec 16-20	Mon-Fri	Final Examinations
Dec 20	Fri	Commencement ceremony