AGED 244

Power, Structure, and Technical Systems in Ag Ed
Class: Tuesdays, 1:30 – 3:10 pm
Lab: Thursdays, 1:30 – 4:20
CoBank Center for Agricultural Education CO Farm Show Classroom

Descriptive Information
Instructor: Nathan Clark
Agricultural Education
Department of Agricultural and Resource Economics
CoBank Center for Agricultural Education
4492 E County Road 56
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Office Hours: Prior to the start of class, at the conclusion of class or by appointment.

Catalog Description:
Development of competencies and theory related to agricultural power, structure, and technical systems utilized in school-based agricultural education programs.
3.000 Credit hour

Course overview:
The Power, Structure, and Technical Systems (PSTS) pathway is an essential component of our secondary agricultural education programs in Colorado. It is essential that agricultural education graduates are provided the knowledge and ability to safely teach and apply the theory and competencies in power, structure, and technical agriculture applications. This course is designed to provide students with the essential information and skills needed to be successful and safe while teaching in the PSTS pathway.

Texts:
None required, selected readings will be provided.

Additional Class Material:
Students will need to provide approved safety glasses and other appropriate safety gear (i.e. closed toe shoes). Access to Dropbox is all required for obtaining access to course materials. All other materials will be provided.

Course Objectives:
1. Understand and practice power, structure and technical systems lab safety
2. Define and utilize plumbing terminology
3. Understand plumbing and water flow calculations
4. Identify tools and equipment used in plumbing processes
5. Identify and describe the different process for joining plumbing pipe
6. Demonstrate and understanding of common plumbing and irrigation designs
7. Define and utilize electrical terminology
8. Describe the principles of an electric circuit
9. Understand electrical calculations
10. Identify and describe electrical conductors & devices
11. Describe how to wire direct and alternating current electrical circuits
12. Discuss the installation, operation and maintenance of electrical motors
13. Identify and select electric motors based upon needs
14. Apply theory & operation of hydraulic systems
15. Discuss the functions of each component on a small and large power engine
16. Describe the service procedure of power mechanics engine systems (including ignition, exhaust, cooling, lubrication, and fuel systems)
Instructional Methodology/Mode of Delivery:
The class will utilize weekly readings, homework, and online lectures, followed by safety tests and classroom discussions. Practical application of principals in the lecture/discussion will be performed in the laboratory setting.

Course Topics/Flow of Course:
1. Identify the dangers of working with plumbing and electricity.
2. Identify tools used in plumbing design and installation.
3. Identify different plumbing materials (pipe) and joints (i.e. couplings).
4. Utilize tools and calculate needed materials to complete a plumbing project.
5. Calculate flow rates and pressures within a plumbing system.
6. Understand the Uniform Building Code as it applies to simple plumbing projects.
7. Recognize proper procedures for joining pipe.
8. Analyze processes for inconsistencies and joining defects.
9. Identify common electrical tools and materials and their applications.
10. Define electrical terms.
11. Calculate the cost of electrical power.
13. Select appropriate conductor size based on current load and length of run.
15. Diagram a common electrical circuit for outlets, lights and switches.
16. Diagram a common direct current electrical circuit.

About CSU Student Honor Pledge: "I have not given, received, or used any unauthorized assistance."

How Did CSU Adopt the Honor Pledge?
During several consecutive student administrations, at least since 2006, ASCSU has discussed promoting the honor pledge as a way to encourage student academic integrity. As her 2008 Honors Thesis, "Shaping a Culture of Academic Integrity at Colorado State University", ASCSU President Katie Gleeson recommended adopting an honor pledge at CSU. A bill to endorse instructors' use of an honor pledge was introduced in the ASCSU Senate in November of 2009. That bill was authored by Eric Whittington, a Senator from the College of Liberal Arts, and had the support of the current and past two Directors of Academics for ASCSU. The bill was discussed by all of the Senate subcommittees and returned to the Senate floor in April of 2010, where it passed. The bill was then forwarded to the Faculty Council and University administration.

The Faculty Council Committee on Teaching and Learning considered the ASCSU recommendation during the 2010-11 academic year. Faculty Council held open forum on the issue in February, resulting in several amendments agreed to by a special task force and the Executive Council. On May 3, 2011 the issue came before Faculty Council. It passed on a unanimous vote with no amendments.

The amendment to the Faculty and Professional Manual, as passed by the Faculty Council, was forwarded to the Board of Governors. It was approved on June 20, 2011. The revised academic integrity section of the Manual, section 1.5 can be seen in its entirety here.

Method of Evaluation:
Students will be evaluated on discussion/participation based on weekly assigned readings, unit safety examinations, weekly laboratory activities, unit quizzes and final examination.

Evaluation Criteria:
- Assignments/Homework/Quizzes: 20%
- Attendance/Discussions/Lab Participation 10%
- Lab Assignments/Projects 40%
- Tests/Examinations: 30%
GRADING SCALE:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A+</td>
<td>100 - 97</td>
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<tr>
<td>A</td>
<td>96.9 - 93</td>
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<tr>
<td>A-</td>
<td>92.9 - 90</td>
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<tr>
<td>B+</td>
<td>89.9 - 87</td>
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<tr>
<td>B</td>
<td>86.9 - 83</td>
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<tr>
<td>B-</td>
<td>82.9 - 80</td>
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<tr>
<td>C+</td>
<td>79.9 - 77</td>
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<tr>
<td>C</td>
<td>76.9 - 73</td>
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<tr>
<td>C-</td>
<td>72.9 - 70</td>
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<tr>
<td>D+</td>
<td>69.9 - 67</td>
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<tr>
<td>D</td>
<td>66.9 - 63</td>
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<tr>
<td>D-</td>
<td>62.9 - 60</td>
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<tr>
<td>F</td>
<td>Below 60</td>
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Note: This grading scale is consistent with EDCT 485, the student teaching experience. As we value preparing you for the next step in your teacher licensure development, grading scales in agricultural education classes will be consistent with the scale used in your final capstone courses.

OTHER IMPORTANT CONSIDERATIONS

Attendance and Participation: There will be an evaluation by the instructor on your participation in this class. Your preparedness to learn, initiative, imagination, creativity, cooperation, and development towards a desirable professional attitudes are critical. Prompt and daily attendance is required. Any student who misses more than two class meetings will be required to withdraw from this class and to re-take it at another time. More than four tardies will likely constitute a major distraction to the instructor and to other class members and will result in a loss of points. If you will be absent from class, an email to the instructor PRIOR to the start of class is required (this is what you would do if you were to be gone from a day of teaching at school). Assignments are STILL due on the due date, whether you are in attendance or not. Please make arrangements accordingly.

Valued professional behaviors include actively participating in class activities, asking probing questions to extend ideas, considering concepts from different perspectives, listening with purpose, contributing in class, collaborating in group processes, demonstrating cooperative behavior, being considerate and courteous to peers/supervising professionals, responsible attendance, arriving on time, meeting assignment deadlines, and other behaviors which promote the goals and objectives of the class. Valued professional behaviors are part of your grade for this course.

Accommodations for Successful Learning: Students who, due to any disabling condition, may need special or unique accommodations in order to succeed in this course are asked to so identify themselves and the accommodations needed to the instructor early in the semester. Every effort will be made to ensure that all students in this course have every opportunity for success. All information provided the instructor will remain entirely confidential.

"A Note to Students: If you have any physical or learning disability which might compromise your success in this class, please make an appointment to see the instructor(s). They are willing to make appropriate accommodations that will enhance your learning opportunities in this class. If you have not already contacted the Office of Resources for Disabled Students, please do so. The location is 100 General Services Building, 970-491-6385."
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Lab Topic</th>
<th>Readings for the Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/21 And 8/23</td>
<td>General information about class General information plumbing Static and Dynamic Pressure</td>
<td>Safety/Plumbing Tools and equip. Common Pipes and fixtures Joining pipe PAS’s</td>
<td>Safety Rules for Lab Modern Plumb Ch. 2 Landscape Man. Ch. 4</td>
</tr>
<tr>
<td>2</td>
<td>8/28 And 8/30</td>
<td>Types of plumbing applications Calculations in Plumbing</td>
<td>Soldering Copper Pipe Joining different Plastic pipes together</td>
<td>Modern Plumb Ch. 4 Modern Plumb Ch. 5</td>
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<tr>
<td>3</td>
<td>9/4 And 9/6</td>
<td>Plumbing systems designs Plumbing applications Trouble Shooting Systems</td>
<td>Irrigation systems design/applications Building system</td>
<td>Study for Test</td>
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<tr>
<td>4</td>
<td>9/11 And 9/13</td>
<td>Finish Content Unit Quiz/Test</td>
<td>Plumbing Exam Practicum</td>
<td>Electricity Ch. 1 Modern Res. Wiring Ch. 2 How Batteries Work</td>
</tr>
<tr>
<td>5</td>
<td>9/18 And 9/20</td>
<td>General Information/Safety AC/DC Power Circuits in Electricity</td>
<td>Safety Tests Tools and equipment Wiring first circuit</td>
<td>Modern Res. Wiring Ch. 4, 5, 6, 7</td>
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<tr>
<td>6</td>
<td>9/25 And 9/27</td>
<td>Review of readings/Quiz Volts, amps, watts Ohms Law Electrical Meters Types and Uses</td>
<td>Wiring diagrams/wiring of circuits Using electrical meters Testing for conductivity</td>
<td>Modern Res. Wiring Ch. 8,9,10</td>
</tr>
<tr>
<td>7</td>
<td>10/2 And 10/4</td>
<td>Overcurrent Protection Service Entrance Panels Sources of electricity</td>
<td>Drawing your own wiring diagrams/wiring of circuits Wiring from entrance panels</td>
<td>Study for Test</td>
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<tr>
<td>8</td>
<td>10/9 And 10/11</td>
<td>Finish Content Unit Test/Exam</td>
<td>Electricity Exam Practicum</td>
<td>Electric Motors Ch. 2, 3</td>
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<tr>
<td>9</td>
<td>10/16 And 10/18</td>
<td>Magnetism Single/Poly phase Motors Types of Electric Motors</td>
<td>Anatomy of Electric Motors</td>
<td>Electric Motors Reading Electric Motors Ch. 6</td>
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<tr>
<td>10</td>
<td>10/23 And 10/25</td>
<td>Wiring a Motor Reading a Faceplate Belts and Pulley</td>
<td>Electric Motor Display Board</td>
<td>How Hydraulics Work Hydraulics Ch. 2</td>
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<tr>
<td>11</td>
<td>10/30 And 11/1</td>
<td>Review of Readings/Test What are Hydraulics How do they work</td>
<td>Hydraulic Anatomy Lab</td>
<td>Hydraulics Ch. 3</td>
</tr>
<tr>
<td>12</td>
<td>11/6 And 11/8</td>
<td>Hydraulic Calculations/Quiz</td>
<td>Hydraulics Lab</td>
<td>Small Gas Readings</td>
</tr>
<tr>
<td>13</td>
<td>11/13 And 11/15</td>
<td>General information/Test Small Gas Engines</td>
<td>Anatomy of Small Gas Engine</td>
<td>Small Gas Readings</td>
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<tr>
<td>15</td>
<td>12/4 And 12/6</td>
<td>Diesel Power/Test</td>
<td>Anatomy of Diesel Power</td>
<td>Review for Final</td>
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<tr>
<td>16</td>
<td>TBD*</td>
<td>Final Exam</td>
<td>Final Lab Practicum</td>
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*According to the final Exam schedule you final should either be on Wed 12/12 from 6:20 to 8:20 pm OR Thurs 9:40 to 11:40 am. We can also discuss a completely different time as well.*