CASPER COLLEGE COURSE SYLLABUS
ELTR 1535 Electrical Power

Semester/Year: Spring 2016

Lecture Hours: 2  Lab Hours: 2  Credit Hours: 3

Class Time: Lec 1-2:50 p.m  Days: Thursday  Room: GW 216
  Lab: 3-4:50 p.m  Days: Thursday  Room: GW 216

Instructor’s Name: Megan Graham
Instructor's Contact Information: Office: GW 116

Office Phone: 268-2539  Email: mgraham@caspercollege.edu

Office Hours: M, T, W, TH 12:00-1:00 p.m.  M, W 5:00– 6:00 p.m.

Course Description:
Fundamentals of AC electrical machines and transformers. Topics covered are electromagnetism, transformers, AC motors motor control, and power quality.

Statement of Prerequisites: Completion of ELTR 1570 or permission of the instructor.

Institutional Outcomes:
☐ Demonstrate effective oral and written communication
☐ Use the scientific method
☐ Solve problems using critical thinking and creativity
☐ Demonstrate knowledge of diverse cultures and historical perspectives
☐ Appreciate aesthetic and creative activities
☐ Use appropriate technology and information to conduct research
☐ Describe the value of personal, civic, and social responsibilities
☐ Use quantitative analytical skills to evaluate and process numerical data

Program Goals:
1. To provide comprehensive training in the fields of electronics technology, so that the associate degree graduate is technically qualified to obtain employment in the electronics industries or an allied field.
2. To provide the necessary training for graduates to continue on to advanced training in an electronics program or a related four-year program.

Course Goals:
The student will
• understand the operation and wiring of 3 phase and single phase AC transformers and motors
• understand the operation, wiring and testing of 3 phase AC motor starters and controllers, including variable frequency drives.
Course Objectives:
Student will be able to:
1. Perform calculations for 3 phase power connections
2. Describe the operation of AC motors and motor control
3. Use NEC codebook for proper wiring methods
4. Read and apply wiring and ladder diagrams used in AC power and motor control.
5. Follow a schematic and wire motor starters and control circuits including a variable frequency drive
6. Follow safe wiring and testing practices
7. Understand the effects of AC motors and motor control circuits on power quality.

Methodology:
Lectures provide information on transformer, motor and motor drive performance. Hands-on exercises will give each student experience in wiring and operating AC motors and transformers. Safe practices in wiring and testing will be demonstrated and required. Make up time for a missed class is by permission only. Missing more than 2 classes will be deemed insufficient commitment to the class and a failing grade will be issued.

Evaluation criteria:
<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Lab Activities</td>
<td>30%</td>
</tr>
<tr>
<td>Tests</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Required Text, Readings, and Materials:
Scientific calculator

Class Policies: Last Date to Change to Audit Status or to Withdraw with a W Grade:
April 14, 2016

Student Rights and Responsibilities: Please refer to the Casper College Student Conduct and Judicial Code for information concerning your rights and responsibilities as a Casper College Student.

Chain of Command: If you have any problems with this class, you should first contact the instructor to attempt to solve the problem. If you are not satisfied with the solution offered by the instructor, you should then take the matter through the appropriate chain of command starting with the Department Head/Program Director, the Dean, and lastly the Vice President for Academic Affairs.

Academic Dishonesty: (Cheating & Plagiarism) Casper College demands intellectual honesty. Proven plagiarism or any form of dishonesty associated with the academic process can result in the offender failing the course in which the offense was committed or expulsion from school. See the Casper College Student Code of Conduct for more information on this topic.
**Official Means of Communication:** Casper College faculty and staff will employ the student's assigned Casper College email account as a primary method of communication. Students are responsible to check their account regularly. This is also, where you will find course evaluation links during course evaluation periods.

**ADA Accommodations Policy:** If you need academic accommodations because of a disability, please inform me as soon as possible. See me privately after class, or during my office hours. To request academic accommodations, students must first consult with the college’s Disability Services Counselor located in the Gateway Building, Room 344, (307) 268-2557, bheuer@caspercollege.edu. The Disability Services Counselor is responsible for reviewing documentation provided by students requesting accommodations, determining eligibility for accommodations, and helping students request and use appropriate accommodations.

**Safety:** Personal and equipment safety standards will be strictly enforced. It is the individual’s responsibility to develop a safe work attitude.
# Calendar or schedule indicating course content:

<table>
<thead>
<tr>
<th>Week</th>
<th>Chapter</th>
<th>Lecture</th>
<th>Lab</th>
</tr>
</thead>
</table>
| 1    | Ch. 3   | 1 Ø Power | Safety  
EX 1: 1 Ø Transformers |
| 2    | Ch. 3   | 1 Ø Autotransformers | Safety  
EX 2: Autotransformers |
| 3    | Ch. 3   | 3Ø Power | EX 3: 3Ø Transformers |
| 4    | Ch. 3   | Balanced and Unbalanced 3Ø Power  
3Ø Power Calculations | EX 4: Balanced and Unbalanced 3Ø Power |
| 5    | Ch. 3   | Test 1 | EX 5: Relays |
| 6    | Ch. 4   | Switches Relays | EX 6: Relay Logic |
| 7    | Ch. 7, Ch. 5 | Relays AC Induction Motors | EX 7: AC Motor Performance |
| March 14-18 | Spring Break | | |
| 8    | Ch. 2, 6, 8 | Motor Starters | EX 8: Motor Starter Diagrams |
| 9    | Ch. 5, 8 | Motor Protection  
NEC Article 430 | EX 9: Motor Starter Wiring |
| 10   | Ch. 2, 6, 8 | Wire and Ladder Diagrams | No Lab |
| 11   | Ch. 8   | Code Calculations | EX 10: Code |
| 12   | Ch. 9   | Test 2 | |
| 13   | Ch. 10  | Electronic Switching Devices Motor Drives and VFDs | EX 11: Drive Motor Testing and VFD |
| 14   |        | Power Quality | EX 12: Power Quality |
| 15   |        | Generators | EX 13: AC Generation |
| Finals | Final Exam as scheduled | | |