Course Name:AC & DC Circuits
Course Prefix: EET
Course Number: 1140
             Submitted by (Name & E-Mail):  Julanne McCulley, jmcculley@weber.edu

Current Date:  11/11/2013
College: Applied Science & Technology
Department:   Engineering Technology
From Term: Fall  2014

Substantive

|  |  |
| --- | --- |
| change  | Current Course Subject CEETCurrent Course Number 1140 |

CEET 1140 - AC and DC Circuits Credits: (4) Typically taught: Spring [Full Sem] Introduction to AC and DC circuit fundamentals, analysis, theorems, laws, components, measuring devices, and equipment. The introduction and use of measuring instruments, power supplies, and signal generators. Lecture and lab combination. Laboratory activities to include circuit design, construction, and analysis of AC/DC circuits. Prerequisite: CEET 1110 and credit for or concurrent enrollment in MATH 1060 or MATH 1080.

**New/Revised Course Information:**

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| Subject:  EET            Course Number: 1140 | Check all that apply: *This is for courses already approved for gen ed.    Use a*[*different form*](http://documents.weber.edu/catalog/forms.htm)*for proposing a new gen ed designation.*DV  CA  HU  LS  PS  SS EN  AI  QL  TA  TB  TC  TD  TE |

Course Title: DC Circuits

Abbreviated Course Title: DC Circuits

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| Course Type:  | LEL |

Credit Hours:  3  **or** if variable hours:    to

Contact Hours: Lecture 2  Lab 2   Other

Repeat Information:  Limit 0   Max Hrs 0

Grading Mode:  standard

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| This course is/will be: | a required course in a major programa required course in a minor programa required course in a 1- or 2- year programelective |

Prerequisites/Co-requisites:

Prerequisite: CEET 1110 and credit for or concurrent enrollment in MATH 1060 or MATH 1080.

Course description (exactly as it will appear in the catalog, including prerequisites):

CEET 1140 - DC Circuits

Credits: (3)
Typically taught:
Spring [Full Sem]

Introduction to DC circuit fundamentals, analysis, theorems, laws, components, measuring devices, and equipment. The introduction and use of measuring instruments and power supplies. Lecture and lab combination. Laboratory activities to include circuit design, construction, and analysis of DC circuits. Prerequisite: CEET 1110 and credit for or concurrent enrollment in MATH 1060 or MATH 1080.

**Justification**for the new course or for changes to an existing course. (Note: Justification should emphasize academic rationale for the change or new course. This is particularly important for courses requesting upper-division status.)

The EET 1140 AC and DC Circuits course has an excessive amount of material to cover effectively in one semester with an aggressive schedule. Students are rushed through the material and we are finding through assessment in subsequent courses that retention levels are low in AC and DC fundamentals as well as circuit analysis. Additionally, student lab skills are proving insufficient.

Course Credit Hour Change
EET 1140 AC and DC Circuits (3 Cr Hrs)
– reduce the credit hours for this course from four credit hours to three credit hours and rename it to DC Circuits, eliminating the material for AC Circuits. Utilize the first six weeks to cover the material in depth that is currently reviewed in breadth in the first two/three weeks. Include additional labs and computer simulations to reinforce DC Circuit theory and to assist students in the development of applied technical skills. Supplement the current course material on network analysis, spending additional time on network theorems, giving students the capability to successfully analyze DC circuits and solve related problems.

A new course proposal for AC Circuits will be submitted as a three credit hour course that will cover the existing AC Circuit fundamentals from the original course as well as extended AC material.

The BS degree in the Electronics Engineering Technology program is accredited by the Technology Accreditation Commission of ABET, http://www.abet.org.

**INFORMATION PAGE**for substantive proposals only

1. Did this course receive unanimous approval within the Department?

true

If not, what are the major concerns raised by the opponents?

N/A

2. If this is a new course proposal, could you achieve the desired results by revising an existing course within your department or by requiring an existing course in another department?

3. How will the proposed course differ from similar offerings by other departments? Comment on any subject overlap between this course and topics generally taught by other departments, even if no similar courses are currently offered by the other departments. Explain any effects that this proposal will have on program requirements or enrollments in other department. Please forward letters (email communication is sufficient) from all departments that you have identified above stating their support or opposition to the proposed course.

4. Is this course required for certification/accreditation of a program?

yes

If so, a statement to that effect should appear in the justification and supporting documents should accompany this form.

5. **For course proposals**, e-mail a syllabus to Faculty Senate which should be sufficiently detailed that the committees can determine that the course is at the appropriate level and matches the description.**There should be an indication of the amount and type of outside activity required in the course (projects, research papers, homework, etc.)**.

**CEET 1140 DC Circuits**

**Instructor:** Julie McCulley

Office: ET 214E

email: jmcculley@weber.edu Phone: 801-626-7267

**Class Time:** Monday and Wednesday 8:30AM – 10:20AM

**Credit Hours:** 3

**Website:** <http://faculty.weber.edu/jmcculley/>

**Required Textbooks**

* Boylestad R. (2007). “Introductory Circuit Analysis”. 12th Edition. Prentice Hall, Upper Saddle River, New Jersey. ISBN: 013714666-6
* Lab Notebook bound, quad-ruled.

**Software Packages:**

Multisim by National Instruments. Multisim will be used to simulate electronic circuits.

MATLAB by MathWorks, Inc. MATLAB will be used as a fundamental computational tool.

**Equipment:** Multimeter

**Course Overview:** Students will be introduced to DC circuit fundamentals, analysis, theorems, laws, components, measuring devices, and electronic lab equipment. The course consists of lecture and lab combination. Laboratory activities include circuit design, construction, and analysis of DC circuits and an introduction in the use of measuring instrumentation, power supplies, and signal generators.

**Prerequisites:** CEET 1110 and concurrent enrollment in Math 1060 or 1080.

**Course Objectives:**

* (SLO1, SLO2, SLO6) Students will demonstrate knowledge of fundamental DC circuit analysis. Students will gain an understanding of the theorems and laws important to circuit analysis. They will be able to identify, analyze and solve DC electronic circuit problems.
* (SLO3) Students will gain experience and proficiency in the lab with measuring devices and equipment and apply experimental results to improve circuit designs. Students will demonstrate their ability to use Matlab and Multisim simulation software.
* Students will understand the importance of industrial safety.

**Homework:** Weekly homework is required and will be due at the start of the class period each Monday. Homework problems for the following week will be assigned at the end of each lecture. Homework must be neatly organized on engineering paper. Late homework (after 1 week at a 10% penalty) or homework that does not follow the instructed format will not be accepted.

**Quizzes:** A weekly quiz will be administered at the start of class each Monday.

**Labs**: Laboratory experiments will be assigned throughout the semester. Labs will be made available one week prior to scheduled lab time to allow preparation of circuit design and construction. Lab time should be spent on troubleshooting and testing of the circuit. All lab work must be documented directly into a quad-ruled notebook using black or blue ink. Any errors are to be crossed out with a single line. Create a table of content page on the first page of your lab notebook.

 Lab Write-up format:

1. Title – identify the lab and include the title in the Table of Contents.
2. Purpose – list the reason for performing the lab.
3. Preliminary – include formulas, hand calculations, and any simulations. Simulations may be neatly glued into the lab notebook.
	1. Include all formulas.
	2. Include all mathematical calculations in detailed steps.
	3. Sketch a schematic with part numbers and pin outs and reference designators for each component clearly labeled.
	4. Organization is key.
4. Procedure Section – note all experimental measurement data.
	1. All recorded data should be in tables.
	2. Include additional calculations required to compare the circuit to the designed circuit in the preliminary section.
	3. Describe instrument settings and observations.
5. Conclusions – summarize your findings and evaluate the results relative to the stated objectives outlined in the purpose section. Include responses to the questions posed in the lab instructions.
6. All pages in the notebook should be numbered. Do not tear any pages from the notebook. Blank pages must be designated with “Page left blank”. Errors are neatly struck or crossed out. Box all important information.
7. Sign and date at the end of each lab assignment.

**Exams**: There will be three in-class exams and a comprehensive final exam.

**Grading**: There will be three midterm exams and a final exam. A weekly quiz will be given that covers the topics from the previous week. Lab books will be graded during examination periods.

 Homework 10%

 Quizzes 5%

Lab Reports 20%

 Exams 3 Exams @ 15%, Final 20%

 Homework Problems - 2 points each, show all work, box your answer.

 Labs - Each lab is worth 20 points.

 Organization and clarity 5pts

 Preliminary 5 pts

 Procedure 5 pts

 Conclusion 5 pts

**Special Needs:** Any student requiring accommodations or services due to a disability must contact Services for Students with Disabilities (SSD) in room 181 of the Student Services Building, 626-6413.

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| --- | --- | --- | --- | --- |
| **Lecture** | **Chapter** | **Lecture Date** | **Lab** | **HW Problems****Due the following Monday** |
| 1 | Ch1: IntroductionCH2: Voltage and Current | Mon 1/6 | **Matlab** EX1  | 1.29, 1.36, 1.38, 1.47, 1.512.2, 2.8, 2.13, 2.15, 2.28  |
| 2 | Ch3: ResistanceCh4: Ohm’s Law, Power, and Energy | Wed 1/8 | Lab 1 Lab Instrumentation**Mabtlab** EX2  | 3.4, 3.19, 3.354.1, 4.2, 4.10, 4.26, 4.45, 4.51 |
| 3 |  | Mon 1/13 | Lab 2 Resistance and Ohm’s Law |  |
| 4 | Ch5: Series DC Circuits | Wed 1/15 | Lab 3 Series Circuits  | 5.4, 5.8, 5.12, 5.13, 5.15, 5.18, 5.31, 5.36, 5.45 |
| 5 | Intro to Multisim Simulation Software | Wed 1/22 | **Multisim** I Ex 5.13a |  |
| 6 | Ch6: Parallel DC Circuits | Mon 1/27 |  | 6.3b,e, 6.5a,e, 6.12, 6.19, 6.24, 6.28b, 6.32a,6.37 |
| 7 |  | Wed 1/29 | Lab 4 Parallel Circuits and **Multisim** II Ex 6.19 |  |
| 8 | Ch7: Series-Parallel Circuits | Mon 2/3 |  | 7.2a, 7.3, 7.12, 7.19,7.26a,b,c |
| 9 |  | Wed 2/5 | Lab 5 Series-Parallel Circuits and **Multisim** III Ex 7.27 a,b |  |
| 10 | **EXAM I** | Mon 2/10 |  | **CH1 – CH7** |
| 11 | Ch8: Methods of Analysis 8.1-8.5, 8.12 | Wed 2/12 |  | 8.5 |
| 12 | Ch8 Section 8.6 Branch | Wed 2/19 |  | 8.15, 8.17 |
| 13 | Ch8 Section 8.7, 8.8 Mesh | Mon 2/24 |  | 8.22, 8.24, 8.25 |
| 14 |  | Wed 2/26 | Multisim IV Mesh |  |
| 15 | Ch8 Sect 8.9, 8.10 Nodal | Mon 3/3 |  | 8.45, 8.61 |
| 16 |  | Wed 3/5 | Multisim V Nodal | **EXAM II Take Home Exam CH8** |
|  | **SPRING BREAK** | March 10 – March 14 |  | MCj04344590000[1] |
| 17 | Ch9: Network Theorems Sect 9.2 Superpostion | Mon 3/17 | Multisim VI Superposition | 9.1, 9.6 |
| 18 | Ch9 Section 9.3 Thevenin | Wed 3/19 |  | 9.8, 9.12, 9.17 |
| 19 |  | Mon 3/24 | Lab 6 Thevenin |  |
| 20 | Ch9 Section 9.4 Norton andMax Power | Wed 3/26 |  | 9.23, 9.25 |
| 21 | Ch10: Capacitors Sect 10.1-10.4 | Mon 3/31 |  | 10.3, 10.6 |
| 22 | 10.11, 10.12 | Wed 4/2 |  |  |
| 23 | Ch10 Section 10.5-10.10 | Mon 4/7 |  | 10.19, 10.25, 10.29, 10.33, 10.39, 10.41 |
| 24 | Ch11: Inductors 11.1-11.4, 11.11, 11.13 | Wed 4/9 |  | 11.13, 11.15, 11.19, 11.21, 11.28, 11.29, 11.38 |
| 25 | Ch11, 11.5-11.10, 11.12 | Mon 4/14 | Multisim VII Capacitors |  |
| 26 |  | Wed 4/16 | Multisim VIII Inductors |  |
| 27 | Ch12: Magnetic Circuits | Mon 4/21 |  | 12.5, 12.11 |
| 28 | **FINAL EXAM** |  |  |  |

Grades

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| --- | --- | --- | --- | --- | --- |
| A | 94 – 100 | A-  | 90 - 93 |  |  |
| B+ | 86 - 89 | B | 82 – 85 | B- | 78 – 81 |
| C+ | 74 – 77 | C | 70 – 73 | C- | 66 – 69 |

***Policies***

If you require accommodations or services due to a disability, you must contact Services for Students with Disabilities (SSD) in room 181 of the Student Service Center at the beginning of the semester.

No cell phones during lecture or lab.

Attendance is extremely important. If you must miss class it is your responsibility to obtain notes and assignments from classmates. Anyone missing more than 3 class periods will receive a departmental drop.

All students are expected to abide by the Student Code found online at: <http://www.weber.edu/ppm/Policies/6-22_StudentCode.html>

*Rights/Responsibilities* - This syllabus is the governing document for this course; your decision to take this course amounts to tacit consent to the conditions of this syllabus. Please review the WSU Policies and Procedures Manual student code regarding ethics found at <http://documents.weber.edu/ppm/6-22.htm>, specifically section IV. Academic dishonesty, as described in the WSU Policies and Procedures Manual, will not be tolerated. Consequences may vary from grade adjustment to expulsion from the university.

Note: Instructor reserves the right to make amendments to the schedule as necessary.



*Lab Notebooks*

1. Quad-ruled 8-½ x 11 inch notebook
2. Black or blue ink
3. Errors are to be crossed out using a single line through the incorrect information.
4. Reserve the first few pages of the notebook for a Table of Contents. This table will be updated with lab titles and page numbers as labs are completed.

Lab Notebook Format

**Table of Contents –** list of all lab assignments on the first page of the logbook**.**

**Title** – each lab will start on a new page with a title that identifies the lab activity and/or lab number. This information will be entered into the Table of Contents at the front of the notebook.

**Purpose** – statement declaring the reason for performing the lab.

**Preliminary** – include formulas, hand calculations, and any simulations. Any printed material can be glued or stapled neatly into the notebook with reference.

* + Include all formulas
	+ Include mathematical calculations in detailed steps and box all important values and information
	+ Sketch a schematic of the circuitry, including component references, part numbers, and pinouts. Values of components should be clearly labeled.

**Procedure** – Note all experimental measurement data.

* All data should be recorded in tables
* Include additional calculations required to compare the calculated values to the gathered data.
* Describe instrument settings and observations

**Conclusions** – summarize your findings and evaluate the results (% error) relative to the stated objectives outlined in the preliminary section. Include responses to the posed questions given in the lab assignment instructions.

**Completion**- sign and date each lab activity following the conclusions.

**Note:** Any blank pages in the notebook should be numbered and designated with “Page Left Blank”. Do not tear any pages from the notebook. Cross out all errors using a ~~strike out~~.