

ELECTRIC CIRCUITS

ENGR 250
Santa Ana College
Department of Engineering
Spring Semester 2012

Lectures: Friday, 10 am – 12:30 pm (hybrid) Room A-214
Units: 3
Instructor: Craig Takahashi, Ph.D. takahashi_craig@sac.edu
Office/office hours: see my website Room A-107-8
Phone: 714-564-6306
Website: <http://sacbusiness.org/engineering/TakahashiC>

Description:

Ohm's and Kirchhoff's Laws, useful theorems for circuit analysis, RC, RL, and RLC circuits, phasors and steady-state sinusoidal analysis, and polyphase circuits.

Prerequisites: Math 280 (vector calculus) and Physics 227 (Engineering Physics II)

Textbook & Materials

1. Fundamentals of Electronics: DC/AC Circuits; David L. Terrell, Delmar Publishers, 2000 (ISBN: 978-0827353404) (REQUIRED).

Grading

Grading is determined on a percentage system, not on a curve. A note on grading: I remind students that I do not GIVE out grades, you EARN them!

Grading Scale	Weighting of grades
A = 90 – 100%	Assignments 25%
B = 80-89%	Exams (2) 40%
C = 70-79%	Final exam 30%
D = 60-69%	Participation 5%
F < 60%	

Tentative Spring Schedule

Wk	Date	Topic	Wk	Date	Topic
1	1/27	Introduction (Ch 1, 2) Lec – atomic theory, charge, units, electrical qty's, Hw 1 – syllabus, website	9	3/30	Magnetism, inductance (Ch 10, 12) Lec – induction, Faraday's & Lenz's Laws, motors, inductive reactance Hw 9 – TBD
2	2/3	Basic concepts/circuits (Ch 3-5) Lec – water analog; series, parallel circuits; Ohm's & Kirchoff's Laws; nodal/loop analysis Hw 2 – TBD	10	4/6	RL Circuits (Ch 13), Review Lec – RL phasors, series/parallel Hw 10 – TBD (short)
3	2/10	Series-parallel (Ch 6) Lec – series-parallel circs, Hw 3 – TBD	11	4/13	Exam 2 Lecture – none Hw 11 – TBD, compute grade
4	2/17	Complex Circuits (Ch 7) Mesh & nodal analysis, superposition Hw 4 – TBD	12	4/20	RLC Circuits (Ch 16) Lec – phasors, resonance Hw 12 – TBD
5	2/24	Complex circuits (Ch 7 – cont'd) Thevenin, Norton, Pi-T/ Δ -Y conversions, Hw 5 – TBD (short)	13	4/27	Power, 3-Phase Circuits Lec – instant/avg/max power transfer, RMS, complex power Hw 13 – TBD
6	3/2	Exam 1 Lecture – none Hw 6 – TBD	14	5/4	Op amps Lec – ideal prop's, op amp circs Hw 14 – TBD
7	3/9	AC Circuits (Ch 11, 14) Lec – Trig fcns, phasors, capacitors, capacitive reactance, Hw 7 – TBD	15	5/11	Diodes, Transistors Lec – semiconductors, doping, BJT, MOSFET's Hw – none
8	3/16	RC Circuits (Ch 15) Lec – phasors, complex #s, Euler's Eqn, & Phasors II lead/lag, Hw 8 – TBD	16	5/18	Final Exam
X	X	(Spring Break: 3/21 – 3/27)			

Communication and Blackboard

I will use the internet regularly to communicate with students. I typically assign homework by posting it my own website (URL: www.sacbusiness.org/engineering/takahashic). I will use Blackboard (Bb) to post grades (rsccd.blackboard.com). It is YOUR responsibility to check these sites regularly to get updates, assignments, etc.

Blackboard (Bb) is a web-based program used to manage courses. Bb requires official enrollment in the course (you must “log on”). If you are unfamiliar with Bb, see me right away. The Bb login username & password are the same as the “WebAdvisor” system. The WebAdvisor (sis.rsccd.edu) username & password was e-mailed to new and returning students. If you have not received an email with this information contact the Admissions Office. Upon first logging into WebAdvisor, you will be prompted to change the temporary password. Your login remains the same each semester, but you may change your password in WebAdvisor at any time. If you change your WebAdvisor password, be sure to use this new password to access your Blackboard account. If you have trouble with Bb, contact the Distance Education office (714-564-6725, Room A-101).

Email – I communicate regularly with the class through email. You are responsible for having a valid email on the WebAdvisor system, or you will not receive these class-wide emails. YOU are then responsible for communicating with classmates about any possible notifications or handouts that I sent by email. When emailing me, always indicate which class you are in (Eg, Engr 122).

Assignments & Exams:

- *Assignments* – may take various forms (homework (hw), lab work (labs), project, write up based on class activities like a film, guest speaker, etc.). Assignments are typically assigned weekly and are due 1 week later in the first 15 minutes of lecture. Any work submitted after the first 15 minutes will receive half credit. Any work submitted after the class period is LATE & will receive a score of 0. Sometimes an assignment are be due the same day it is assigned (usually when doing a class activity, see assignments & absences below). All work must be labeled in the upper right (except in drafting classes where it should appear in the title block of EACH sheet) of the front sheet (student name, hw #, course #; – e.g., John Doe, hw#1, E 100A), stapled in the upper-left with pages oriented consistently (in drafting classes orientation shall be “landscape”), & with problems in the order assigned or points will be deducted. I understand that issues in your life will occur from time to time, so the lowest assignment score will be deducted to account for this. If you miss lecture, your work is still due on time (see below). Emailed work is not accepted.
- *Assignments & absences* – If you miss lecture, assignments are still due on time. If you want credit, you must arrange for your work to be somehow turned in on time in class. I do not accept emailed work. If you are absent the day of an activity-based assignment that is due the same day, you will not get credit for that work and there are no make-ups.
- *Exams* – 1 or 2 (see tentative schedule) midterm exams will be given during the semester. Any exam not taken during the allotted time is a “make-up” exam. Make-up exams are HIGHLY discouraged & are granted at the instructor’s discretion. Students must request make-ups in a timely fashion (before or within 1 day of the exam) & must provide documentation to verify the cause of the missed exam. Make-ups are allowed only once & have an automatic 15% deduction (REGARDLESS OF CAUSE). There are no make-ups for final exam.
- *Final project* – (see tentative schedule). Projects must be worked on independently unless otherwise noted. No late projects will be accepted.
- *Participation grade* – is based on the level of involvement in the class (e.g.: turning in assignments, actively listening to lecture, ask questions, and engage in dialogue with instructor & others).

Course policy and conduct

- *Formal reviews* – If you feel an assignment (hw, lab, project, or exam) was graded in error and wish for the work to be re-graded, you must request a “formal review” within 7 days of the work being returned to you (after the 7 day period, the work will not be re-graded). Submit a *typed* cover sheet with your full name, student number, date, and description of the assignment that you want reviewed. Explain *in detail* (using sketches or drawings if necessary) why the grading was incorrect & why your score should be higher. Staple the questionable assignment to the cover sheet. A review will evaluate the *entire* assignment, not just the issue with which you were concerned. Thus, the review may possibly result in a lower overall score. An incorrectly-entered grade in Blackboard does NOT require a review. Just inform me within 7 days of the grade posting and show me the graded work.
- *Honesty/Integrity Policy* – although you are encouraged to communicate with classmates about course concepts, you may only turn in your own work. Any assignment that has been deemed plagiarized or copied is cheating and will receive a score of 0 (for both the copier and the one who allowed the copying). Any student who violates this rule a second time will be given an F for the course. Projects must be worked on independently unless otherwise specified. A student found cheating on any exam will receive a 0 for that exam. A second instance of cheating will result in an F grade for the course.
- *Attendance/absences* – Students MAY be dropped if they do not appear for the first class meeting or if they reach 3 total absences for the semester (including those prior to adding the class). Attendance is tracked by your initialing of a sign-in sheet each week. YOU are responsible for initialing the sheet, you are considered absent if you fail to initial the sign-in sheet. If you forget, it is still an absence! If you are absent from class, it is your responsibility to get class notes, handouts, and/or directions from a classmate. If you miss lecture, hw is still due (see “hw” section above). Only initial for yourself. If you initial for someone else, it is fraud, and you will be dropped from the class.
- STUDENTS are responsible for officially withdrawing from classes they do not plan to complete. The deadline for withdrawing from class is the end of the 12th week of the semester. After this time, a student CANNOT withdraw & WILL receive a letter grade for the course. Under extenuating circumstances (such as verified cases of accident, illness, or death in the family & other conditions beyond the control of the student), a student may be reinstated by contacting the instructor. Students are responsible for checking the semester schedule for important dates such as holidays and drop dates.
- *Student with Disabilities* – students with verifiable disabilities who want to request academic accommodations must notify Disabled Student Programs & Services (DSPS; x6260, 6384 TDD for deaf students, U103) and myself as soon as possible.
- *Pagers or Cell Phones* – please be considerate to your classmates & turn off (or set to vibrate) all pagers and cell phones while in the classroom. If you are on-call for emergencies (medical, childbirth, etc.), please let me know at the beginning of the class. Students may be asked to leave the class session for cell phone/pager violations.
- *Food* – students may not bring food or drink into the classrooms. Water is okay.
- *Lab conduct* – (applicable to classes with a lab or hands-on activities) is related to the level of care you give to yourself, your fellow students, the lab equipment, the classroom, & to lab organization and clean-up (putting stuff away properly and neatly).
- *Other* – any student claims about something I verbally “allowed” (e.g., “you said I could take a make-up final”, “you said there was no hw”, “you said I would not be dropped even if I missed most of the lectures,” etc.) must be substantiated with some type of verifiable documentation – in particular, an email from me. If it isn’t written, it didn’t happen.