**Syllabus**

**ELEN 050 – Electric Circuits I**

**Winter, 2017**

**Instructor: Stephen Hudgens**

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**Room: EC 107 (MWF 9:15 – 10:20)**

**Office Hours: MECH 603B Mon/Wed 10:45 – 12:00 and by appointment**

**Canvas Website:**

**Course Objectives:**

1. To understand the fundamental principles of DC and AC circuit analysis sufficiently well to solve practical problems in all branches of engineering.
2. To apply circuit principles toward the development of practical systems.

**Expected learning outcomes:**

1. Formulate Kirchoff current and voltage law equations in a systematic manner.
2. Formulate and solve node voltage and loop current equations
3. Compute Thevenin equivalent circuits and apply them in circuit analysis
4. Analyze circuits using operational amplifiers
5. Use phasor techniques to compute sinusoidal steady state solutions in linear circuits.
6. Design and test circuits that meet a given set of specifications.

**Textbook: Electric Circuits – Nilsson and Riedel 8 th or 9th Edition Prentice Hall.**

**Course Content:** A list of course topics can be found on the attached course time schedule grid.

**Homework:** Homework is assigned more or less on a bi-weekly basis, with the assignment date and the due date established by the course instructor.

**Laboratory:** The laboratory will parallel class work. The TAs will give you more details, and general guidelines and lab documents are posted on the Canvas website for the class in the LAB folder. Be sure to check this site for Prelabs, Tutorials, and Lab writeups. The grade for the lab is separate from the grade for the main part of the ELEN 50 course.

**Grading:** Homework 20%

Midterms 35%

Final 45

**Syllabus Statements on Disabilities Resources,**

**Sexual Harassment and Discrimination (Title IX Resources),**

**and Reporting Requirements**

**September 2015**

**Disabilities Syllabus Statement**

*If you have a disability for which accommodations may be required in this class, please contact Disabilities Resources, Benson 216,* [*www.scu.edu/disabilities*](http://www.scu.edu/disabilities) *as soon as possible to discuss your needs and register for accommodations with the University. If you have already arranged accommodations through Disabilities Resources, please discuss them with me during my office hours. Students who have medical needs related to pregnancy or parenting may be eligible for accommodations.*

*While I am happy to assist you, I am unable to provide accommodations until I have received verification from Disabilities Resources. The Disabilities Resources office will work with students and faculty to arrange proctored exams for students whose accommodations include double time for exams and/or assisted technology. (Students with approved accommodations of time-and-a-half should talk with me as soon as possible). Disabilities Resources must be contacted in advance to schedule proctored examinations or to arrange other accommodations. The Disabilities Resources office would be grateful for advance notice of at least two weeks. For more information you may contact Disabilities Resources at 408-554-4109.*

**Title IX Syllabus Statement**

*Santa Clara University upholds a zero tolerance policy for discrimination, harassment and sexual misconduct. If you (or someone you know) have experienced discrimination or harassment, including sexual assault, domestic and dating violence or stalking, we encourage you to tell someone promptly. For more information, please go to* [*www.scu.edu/studentlife*](http://www.scu.edu/studentlife) *and click on the link for the University’s* [*Gender-Based Discrimination and Sexual Misconduct Policy*](http://www.scu.edu/studentlife/resources/upload/Gender-Based-Discrimination-and-Sexual-Misconduct-Policy-Publication-June-2015-Final-Copy.pdf) *or contact the University's EEO and Title IX Coordinator, Belinda Guthrie at 408-554-3043 or by email at bguthrie@scu.edu. Reports may be submitted online through* [*www.scu.edu/osl/report*](http://throughwww.scu.edu/osl/report) *or anonymously through Ethicspoint:*[*www.ethicspoint.com*](http://www.ethicspoint.com.)

**Statement for Syllabi on Reporting Practices (adapted, with permission, from Scott Lewis’s SCU presentation on Title IX)**

*While I want you to feel comfortable coming to me with issues you may be struggling with or concerns you may be having, please be aware that there are some reporting requirements that are part of my job at Santa Clara University.*

*For example, if you inform me of an issue of harassment, sexual violence, or discrimination, I will keep the information as private as I can, but I am required to bring it to the attention of the institution’s EEO and Title IX Coordinator. If you inform me that you are struggling with an issue that may be resulting in, or caused by, traumatic or unusual stress, I will likely inform the campus Student Care Team (SCU CARE).*

*If you would like to reach out directly to the Student Care Team for assistance, you can contact them at* [*www.scu.edu/osl/report*](http://throughwww.scu.edu/osl/report)*. If you would like to talk to the Office of EEO and Title IX directly, they can be reached at 408-554-3043 or by email at* [*bguthrie@scu.edu*](mailto:bguthrie@scu.edu)*. Reports may be submitted online through* [*www.scu.edu/osl/report*](http://throughwww.scu.edu/osl/report) *or anonymously through Ethicspoint:* [*www.ethicspoint.com.*](http://www.ethicspoint.com.) *Additionally, you can report incidents or complaints to the Office of Student Life (OSL), Campus Safety Services, and local law enforcement. For confidential support, contact the Counseling and Psychological Services office (CAPS), the YWCA, or a member of the clergy (for example, a priest or minister).*

*Finally, please be aware that if, for some reason, our interaction involves a disruptive behavior, a concern about your safety or the safety of others, or potential violation of University policy, I will inform the Office of Student Life. The purpose of this is to keep OSL apprised of incidents of concern, and to ensure that students can receive or stay connected to the academic support and student wellness services they need.*

# ELEN 50 Class Organization Structure

The upper left entry shows calendar date and the upper right entry is the sequential class number. The topic for each class and the relevant pages in the Nilsson and Riedel 9th Edition textbook are also shown.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Week | Class |  | Class |  | Class | Lab |
| 1 | 1/9 01  Units, Power and Energy  1 -30 |  | 02  V and I Sources,  Resistance  23-30 |  | 03  Ohms Law – Ckt Topology  30-36 | **Lab 0**  Intro to MATLAB |
| 2 | 1/16 04  MLK Day Holiday |  | 05  Circ. Models, Kirchhoff’s Laws  37-46 |  | 06  Resistive Circuits  56-70 | **Lab 1**  Vectors and Matrices in MATLAB |
| 3 | 1/23 07  Source Transformation  109-116 |  | 08   to Y Y to    |  | 09  Ckt. Analysis: Node Voltages  93-94 | **Lab 2**  Series and Parallel Resistors |
| 4 | 1/30 10  Dependent Sources and Supernodes  95-98 |  | 11  Node Voltage Examples |  | 12  Thevenin and Norton Equiv.  113-120 | **Lab 3**  Wheatstone Bridge |
| 5 | 2/6 13  Maximum Power Transfer  . 120 -122 |  | 14  Midterm Review |  | 15  Midterm Exam I | **Project 1**  Optimal Power Delivery |
| 6 | 2/13 16  Mesh Current Method  99- -102 |  | 17  Mesh Current Examples  92-95 |  | 18  Superposition and Solution by Inspection  97-98 | **Project 1**  Optimal Power Delivery |
| 7 | 2/20 19  Operational Amplifiers  131 -144 |  | 20  Midterm Review |  | 21  Midterm Exam II | **Lab 4**  Op Amp Circuits |
| 8 | 2/27 22  Op.Amp. Examples  145 -153 |  | 23  Capacitors and Inductors  182-208 |  | 24  RC and RL Examples  208 -220 | **Lab 5**  Transient Response |
| 9 | 3/6 25  Sinusoidal Steady State  330 -337 |  | 26  Complex Number Review  Phasors  337 -346 |  | 27  More Phasor Problems | **Project 2**  Basic Filter Design |
| 10 | 3/13 28  Steady State AC Power  390 -398 |  | 29  RMS Values Complex Power  390 -407 |  | Final Review | **Project 2**  Basic Filter Design |
|  | 3/20 Final Exam Week |  |  |  |  |  |