SYLLABUS

COURSE:	ENGR-210
LOCATION:	Q-10 (Lecture and Lab)
TIME:	Tuesday: 6:00 – 8:50pm Thursday: 6:00 – 8:50pm
	Note: The course will have a combined lecture and lab with topics that may overlap throughout the combined allotted time period, each class day
INSTRUCTOR:	Alex Besprozvanny
E-Mail:	rbesprozvanny@palomar.edu
Office Hours:	By appointment
COURSE WEBSITE:	http://pcpepso.com/engineering/engr210/
PRE-REQUISITES:	PHYS231 (or equivalent)
GRADING:	Quiz (15%) – Weekly Midterm 1 (15%) – 3/2/2017 (Tentative) Midterm 2 (15%) – 4/6/2017 (Tentative) Midterm 3 (15%) – 5/2/2017 (Tentative) Final Exam (20%/20%) – 5/25/2017 (Discussion/Written) Lab Assignments (50%) – Bi-Monthly Final Lab Project (50%) – 5/23/17 (Tentative) Note 1: Must pass the lab in order to pass the lecture (and vice versa) Note 2: Only scientific calculators can be used on the test (no graphing) Note 3: You must complete a final project in order to pass the lab
HOMEWORK:	Completing these assignments are important in reinforcing the lecture and textbook material, and thus it is expected to be completed within one week of being posted. However, homework will not be collected or graded.
FINAL EXAM:	The final exam shall encompass both written and discussion based sections and will be conducted on the scheduled day. The written based test will require both mathematical and analytical solutions while the discussion based test evaluates conceptual understanding of the course material.
TEXTBOOKS:	**COURSE BOOK**: Charles Alexander and Matthew Sadiku, “Fundamentals of Electric Circuits”, McGraw Hill, Sixth Edition, 2013, ISBN: 978-0078028229 (Required) **PSPICE REFERENCE**: Joseph Tront, “PSpice for Basic Circuit Analysis”, McGraw Hill, Second Edition, 2001, ISBN: 0-13-015796-1 (Recommended)
SUPPLEMENTAL:	**DIFFERENTIAL EQUATIONS**: Erwin Kreyszig, “Advanced Engineering Mathematics”, John Wiley & Sons Inc., Eighth Edition, 1999, ISBN: 978-0471154969 (Recommended) **SEMICONDUCTOR THEORY AND ANALYSIS:** Allan Hambley, “Electronics”, Prentice Hall, Second Edition, 2007, ISBN: 0-07-310365-9

STUDY REFERENCES: **SCHAUMS OUTLINES:** Jimmie Cathey, "Basic Electrical Engineering", McGraw Hill, 1996, ISBN: 0-07-011355-6 (Recommended)

SCHAUMS OUTLINES: John O'Malley, "Basic Circuit Analysis", McGraw Hill, Second Edition, 2011, ISBN: 978-0071756433 (Recommended)

SOFTWARE: Linear Technology "LTSpice" or Texas Instruments "TINA-TI" or other SPICE solver

LABORATORY:

The laboratory assignments will contain a mix of hands-on experiments and simulation analysis. It is recommended that each student obtain the following basic electronic test equipment: Multi-Meter, Breadboard, Wire Stripper (AWG 20 – 30 recommended), Wire (AWG 24), Tool Box, AC to DC power transformer (Vout: 5V and Iout >=100mA), Lab Notebook.

The final project shall include a hands-on design where each student is expected to build a prototype, present a power-point presentation of their project to the class and demonstrate its functionality. Projects can include one to three members where each project must be approved by the instructor. Each project shall be funded by the group members.

SPECIAL CONSIDERATIONS:

If you have any specific needs or requirements, please notify your instructor as soon as possible.

ACADEMIC DISHONESTY POLICY:

It is encouraged that students work together to help develop a more comprehensive understanding of the introduced concepts. However, all submitted work must be the individual work of each student. Any confirmed types of academic dishonesty, including (but not limited to) copying homework's, cheating on exams, plagiarism and etc. will result in an automatic failure for the course and lab. Campus and department policies regarding academic integrity will be enforced.

COURSE DESCRIPTION:

This course is designed to introduce students to the physical basis, mathematical models and analytical methods of electrical components and circuits by covering the following topics:

Fundamentals of voltages and currents, power, energy, basic circuit elements, basic circuit laws, various circuit networks, network analysis techniques, linearity and superposition, Thevenin and Norton equivalent circuits, maximum power transfer, conjugate matching with reactive elements, three-phase power systems, amplifiers, OP-AMP circuits, feedback, time-varying circuits, natural and forced response linear circuits, first order and second order transient circuits, first order and second order OP-AMP circuits, complex numbers, phasors, impedance and admittance, diodes, BJT's, FET's, magnetically coupled circuits, frequency response, active and passive filters, Bode plots, resonant circuits, Laplace transform and Fourier series.

ENGINEERING STUDENT LEARING OUTCOME (SLO):

Successful students will be able to set up an experiment of an LCR circuit and will be able to collect accurate and necessary data to show understanding of electrical components, electrical circuits, and behavior of electrical components used in DC and AC circuits. Successful students will be able to set up an experiment of an OPAMP model for networks and will be able to collect accurate and necessary data to show understanding of electrical components, electrical circuits, and behavior of electrical components.

COURSE OUTLINE (Tentative):

The course will be structured to include the following general topics. Completion of the reading section is strongly recommended prior to the start of class.

WEEK	DATE	TOPIC	READING SECTION
1	1/31/17	Physical Principals (Overview)	1.2-1.4
	2/2/17	Basic Circuit Elements, Basic Circuit Laws	1.5-1.6, 2.2-2.3
2	2/7/17	KCL, KVL, Resistor Networks, Δ-Y circuits, Node/Mesh	2.4-2.7, 3.2, 3.4
	2/9/17	Super Node/Mesh, Dependent sources	3.3, 3.5
3	2/14/17	Superposition, Linearity, Norton, Thevenin, Source Transform	4.2-4.3, 4.5-4.6
	2/16/17	Lab Day	
4	2/21/17	Max. Power Transfer, Amplifiers, Input and Output Impedance	4.4, 4.8, 5.2
	2/23/17	Op-Amps, Feedback	5.2-5.4
5	2/28/17	Op-Amp Circuits	5.5-5.8
	3/2/17	MIDTERM 1	
6	3/7/17	Capacitors and Inductors, First Order Op-Amp Circuits	6.2 - 6.5, 6.6.1 - 6.6.2
	3/9/17	AC Circuits, Transient Circuit Analysis	7.2-7.4
7	3/14/17	First Order Circuit Analysis	7.5-7.6
	3/16/17	Second Order Circuit Analysis	8.2-8.6
8	3/21/17	Second Order Circuit Analysis, First Order Op-Amp Circuits	8.7-8.8
	3/23/17	Sinusoids, Phasors, Impedance	9.2 - 9.5, 9.7
9	3/28/17	SPRING BREAK	
	3/30/17	SPRING BREAK	
10	4/4/17	AC Power (Instantaneous, Average, RMS, Conjugation)	11.2 - 11.6
	4/6/17	MIDTERM 2	
11	4/11/17	Magnetic Circuit Elements, Transformers	13.2 - 13.5
	4/13/17	Impedance Matching, Frequency Response, Bode Plots	14.2-14.4
12	4/18/17	Passive Filter Circuits, Resonant Circuits	14.5-14.7
	4/20/17	Series-Parallel Resonant Circuits, LaPlace, Fourier Series	15.2 - 15.3, 17.2, 17.4
13	4/25/17	Diodes, Basic Diode Circuits	Supplemental Material
	4/27/17	BJT Transistor Theory, BJT Amplifier Circuits, BJT Amplifier Circuits	Supplemental Material
14	5/2/17	MIDTERM 3	
	5/4/17	Final Project Development	
15	5/9/17	Final Project Development	
	5/11/17	Final Project Development	
16	5/16/17	Final Project Development	
	5/18/17	Final Project Development	
17	5/23/17	FINAL PROJECT PRESENTATIONS	
	5/25/17	FINAL EXAMINATION	