Sirindhorn International Institute of Technology

Thammasat University

School of Information, Computer and Communication Technology

ECS 303: Basic Electrical Engineering

Semester/Year: 2/2009

Course Title: Basic Electrical Engineering
Instructor: Dr. Prapun Suksompong (prapun@siit.tu.ac.th)
Course Web Site: http://www.siit.tu.ac.th/prapun/ecs303/

Lectures:

Room: RS408
Time:

- Friday 09:00-10:30 (Tutorial)
- Friday 10:40-12:00
- Friday 13:00-14:20

You are STRONGLY encouraged to attend lectures. (See the grading policy below.)

Student Dress Code:

- Students must wear Thammasat University uniform OR polite dress.
- Plain white shirt, properly tucked in.
- Plain trouser/skirt in dark color.
- The followings are not allowed:
    - Sandals
    - T-shirt (even with the shop shirt)
    - Polo-shirt (even with the shop shirt)

Course Information

Prerequisite: None

Course Description: This course introduces basic electrical engineering principles and technology to students outside the electronics and communication curriculum. Topics include electrical signals, basic circuit theory, DC and AC circuit analysis, Kirchhoff's law, Thevenin/Norton theorems, basic electronic devices and circuits, fundamental of operational amplifiers, feedback and control, fundamentals of power systems, three-phase circuits, DC and AC motors and generators, transformers, household/industry wiring, and preview of electrical communication systems.

Textbook: C.K. Alexander and M.N.O. Sadiku, Fundamentals of Electric Circuits, 4th ed., McGraw-Hill, International Edition, 2009.

References:
- J. D. Irwin, Basic Engineering Circuit Analysis, John Wiley & Sons, 2002 (TK454 I78 2002).
- J. O'Malley, Schaum's Outline of Theory and Problems of Basic Circuit Analysis, 2nd Edition, 1992 (TK454 O46 1992).

Grading Policy: Coursework will be weighted as follows:

Assignments	5%
Class Participation and Quizzes	15%
Midterm Examination	40%
Final Examination (comprehensive)	40%

- No late assignments will be accepted.
- Cheating will not be tolerated
- Copying homework/quiz/exam = cheating
  - Punishment:
    - First time cheater receives zero on that assignment
    - Second time cheater receives zero on all quizzes and/or HWs

Assignments: Homework will be assigned throughout the semester. Only some selected problem will be graded. Of course, you do not know which problems will be selected; so you should work on all of them. The complete solutions to all problems will be posted on the course web site.

Quizzes and Exams: All quizzes and exams will be closed book.

Quizzes will relate to current and previous topics. A quiz may be given at any time during any class period – at the beginning or end of a class, etc. There will be no make-up quizzes. Quizzes will be given only to those students who are present when the quizzes are passed out.

The instructor should be notified before missing any exam if at all possible and immediately thereafter when not possible. The instructor (and/or the fact-finding committee) will determine if the absence from an exam is legitimate. Simply not feeling well is not a reason to miss an exam. In the case of legitimate absence, an oral and/or written make-up exam could be arranged.

Expectations: You should expect to spend extra 5-8 hours per week studying outside of class. However, I do expect you to come to class and participate actively in class discussions. If you must miss a class, I expect you to find out what happened, either from me or one of your classmates. You are responsible for all materials that are discussed in class.

Academic Integrity

The work you submit in ECS 303 is expected to be the result of your individual effort. You are free to discuss course material, approaches to problems with your colleagues or the instructor but you should never misrepresent someone else's work as your own.

It is your responsibility to protect your work from unauthorized access. For example, do not discard copies of your programs/assignments in public places.

Course Outline

The following is a tentative list of topics with their corresponding chapters from the textbook by Alexander and Sadiku.

Topics	Textbook Chapter
1. Intro, math review, units, quantities & measurements	1
2. Intro electric circuits: Ohm's Law, node/branches/loops, Kirchoff's Laws, resistive circuits	2
3. Series/parallel resistors, voltage divider, current divider, nodal analysis	2, 3
4. Mesh analysis, linearity, superposition	3, 4
5. Source transformation, Thevenin's/Norton's equivalent circuits, maximum power transfer	4
6. Basic electronics: Op amps	5
7. **MIDTERM**: 25 Dec 2009 TIME 09:00 - 12:00	
8. Capacitors and inductors; diodes	6
9. First-order circuits	7
10. Electric power systems. Sinusoids, phasors; complex number review	9
11. Phasor relationships for circuit elements, impedance and admittance, Kirchoff's laws in frequency domain, impedance combinations.	9
12. Sinusoid steady-state analysis: nodal/mesh analysis, superposition theorem, source transformation, Thevenin/Norton equiv. circuits	10
13. AC power analysis: instantaneous and average power, maximum average power transfer, effective or RMS value, apparent power and power factor. Power factor correction.	11
14. Three-phase circuits, transformers, household/industry wiring	12, 13
15. Preview of communication systems (if time permitted)	
16. **FINAL**: 5 Mar 2010 TIME 09:00 - 12:00	