Department of Electrical and Computer Engineering
Faculty of Engineering and Architecture
American University of Beirut

Course Information

Course title: Introduction to Electrical and Computer Engineering

Course number: EECE 200

Catalog description:

Overview of electrical and computer engineering; engineering as a profession; introduction to the different areas of ECE such as biomedical systems, circuits, communications, computer design, control, distributed systems, electromagnetics, energy, machines, and signal processing; basic computer tools such as SPICE, MATLAB, and LabVIEW; basic laboratory instruments; laboratory experiments and design project.

Credit hours: 3 credits

Required or elective:
Required for CCE / ECE students

Prerequisites:
By course: None
By topic: High school mathematics and physics.

Textbook(s) and/or required materials
R.M. Ford and C.S. Coulston, "Design of Electrical and Computer Engineers, " McGraw-Hill International Edition, 2008

References:

- Introduction to Electrical Engineering, Sarma, Oxford University Press, 2001 (621.3:S246i)
- Introduction to Electrical and Computer Engineering, Fleddermann and Bradshaw, Prentice Hall, 2003
- Introduction to Engineering, Burghardt, Harper Collins, 1992 (620.002:B956i)
- Tools and Tactics of Design, Prentice Hall, Wiley, 2001 (620.004:T671d).

Course Objectives

The objectives of this course are to:	*Correlates to program objectives*
Introduce students to the engineering profession	3,4
Provide students with an overview of engineering ethics	4
Present to the students the various areas of electrical and computer engineering	1,4
Introduce students to some basic mathematical and computing tools used in electrical and computer engineering	2
Foster effective communication and teamwork skills among students	3

Course Topics

No.	*Subjects covered*	*50 min. lectures*
1	*Introduction to different areas of engineering*	2
2	*Mathematical Skills* (Complex numbers, number systems)	2
3	*Engineering as a profession* (engineering analysis and design, engineering ethics, engineering project management, professional communications, IEEE)	11
4	*ECE areas* (circuits & electronics, power, renewable energy, communications, electromagnetics & radio frequency, signal and image processing, computer hardware, software, networks & distributed systems, control, machines, and biomedical engineering.)	11
5	*Introduction to ABET*	1
6	*ECE tools* (PSpice, LabVIEW, MATLAB, Library resources)	4

Laboratory Topics

No.	*Experiment Topic*	*lab session (3 hrs)*
1	Introduction to MS Office	1
2	Introduction to SPICE	1
3	Introduction to MATLAB	1
4	SPICE/ MATLAB application on engineering problem	
5	Library resources and information sources usage	1
6	Getting familiar with LABVIEW	1
7	Getting familiar with LABVIEW DSP module and SPEEDY-33 Analog and Digital Applications	1
8	Introduction to Robotics	1
9	Audio Effects using LABVIEW and SPEEDY-33	1
10	Communication Systems using LABVIEW and SPEEDY-33	1
11	Image Processing using LABVIEW	1
12	Design Project (Hardware and Software implementation and integration)	3

Course Learning Outcomes

At the end of the course, students:	*Correlates to program outcomes**		
	H	*M*	*L*
1. Have a realistic understanding of the different engineering profession and the working environment of engineers	(f)		(h)
2. Understand engineering ethics and are familiar with the IEEE code of ethics	(f)		
3. Understand engineering problem-solving concepts and		(e)	(a)

principles			
4. Demonstrate an understanding of the engineering design process including problem formulation, constraints, alternatives, prototyping and testing	(c)		
5. Have developed an awareness of challenges occurring in teamwork (Task division, communication skills…)		(d)	
6. Appreciate the importance of project planning and scheduling		(k)	(e)
7. Have developed presentation skills	(g)		
8. Are able to recognize and locate reliable sources of information (library, web…)			(i) (k)
9. Are aware of the various areas of electrical and computer engineering: circuits & electronics, power and renewable energy, communications, electromagnetics & radio frequency, signal and image processing, computer hardware, software, networks & distributed systems, control, machines, and biomedical engineering.			(h) (j) (n) (o)
10. Are introduced to several engineering software that will be utilized in the coming years (Spice, MATLAB, and MS Office)	(k)	(g)	
11. Are familiar with the use of LabVIEW as a programing and design tool	(k)		
12. Have learned proper project management and documentation	(k)		

* *H: High correlation, M: Medium correlation, L: Low correlation*

Class/laboratory schedule

a- Two 50-minute lectures per week.
b- One three-hour lab session per week.

Resources of the course

Reference books, online references, Lecture material, Lab manuals, Clickers.

Computer usage

LabVIEW, PSpice, MATLAB, MS Office, Email/Web, Moodle.

Evaluation methods

1.	Midterm	20%	individual
2.	Computer Lab Assessment	15%	individual
3.	Homework assignments (2)	2 x 3% = 6%	individual
4.	Labview Quizzes (5)	5 x 3% = 15%	individual
5.	Project	35%	teams
6.	Lecture Quizzes and Attendance	8%	individual
7.	Assessment of course outcomes	1%	individual

Professional component

Engineering topics: 95%
General education: 0%
Mathematics and basic sciences: 5%

Preparation and Revision

Prepared by Ayman Kayssi in September 2006
Revised by Ayman Kayssi in January 2009
Revised by EECE 200 Ad-Hoc Committee in June 2009
Revised by EECE 200 Ad-Hoc Committee in November 2012
Revised by EECE 200 Ad-Hoc Committee in August 2013