

UMBC UGC New Course Request: CMPE 101 Introduction to Computer Engineering

Date Submitted: Oct. 1, 2009

Proposed Effective Date: Immediately

	name	email	phone	dept
dept chair	Charles Nicholas	nicholas@umbc.edu	x58181	CSEE
contact	John Pinkston	pinkston@umbc.edu	x51338	CSEE

COURSE INFORMATION:

course number(s)	CMPE 101
formal title	Introduction to Computer Engineering
transcript title (≤24c)	Intro Comp Engineering
prerequisite	None
credits	3
max. repeat credits	0
grading method(s)	Reg (A-F) Audit Pass-Fail

PROPOSED CATALOG DESCRIPTION:

Introduction to engineering, with emphasis on the electrical and computer disciplines. It introduces the engineering discipline and the non-technical, social, ethical, and environmental issues that an engineer must take into account. Design process, working in teams, oral and written communication skills are covered. Technical topics include DC circuits, laboratory instrumentation, computer organization, machine language, and programming in a language such as C. Students will work in teams on a design project, which includes design, construction, evaluation, testing, modeling and presentation. Prerequisite: MATH 150 or equivalent.

RATIONALE FOR NEW COURSE:

- a. This course will take the place of ENES 101 for the computer engineers. There continues to be a need for an introductory engineering course for freshmen, but we would like to offer such a course with more orientation toward electrical and computer engineering as more relevant for students intending to major in this field.
- b. It will be offered at least once per year, and possibly every semester, depending on enrollments.
- c. This course will be the first course required of all CMPE majors.
- d. The course serves freshmen intending to major in computer engineering.
- e. Self explanatory
- f. Recommended preparation: The course is intended for freshmen engineering students, and assumes high school math through trigonometry, equivalent to Math 150, and some high school natural science. It is desirable for even the beginning engineering student to have a high school preparation in science and math. In the unlikely event that there is a student without this preparation who wants to major in engineering, that student would be advised to take some math and science first.
- g. While it is not likely that non-engineering majors will take this course, it is not precluded, and those non-majors could elect to take it on an audit or pass/fail basis.

ATTACH COURSE OUTLINE (mandatory):

COMPUTER ENGINEERING CMPE 101

**INTRODUCTORY ENGINEERING SCIENCE
FOR COMPUTER ENGINEERS**

UNIVERSITY OF MARYLAND BALTIMORE COUNTY

Course Syllabus

INSTRUCTOR: John Pinkston
Office: ITE 327
Phone: (410) 455-1338
EMAIL: pinkston@umbc.edu
Office hours:

CLASS MEETINGS: **Lecture:**
 Discussions:

COURSE OBJECTIVE:

This course will introduce beginning students to the field of engineering and what an engineer does. It will cover concepts of engineering design and the product development process, with the orientation toward electronics and computer engineering. Social, ethical, and environmental issues that an engineer must be sensitive to will be studied.

Engineering fundamentals such as data analysis, computer organization and programming, and basic circuit theory will be studied.

These objectives will be achieved within the framework of a team environment. Each team will design, construct, evaluate, test and present (written and orally) an assigned project. Each individual student will develop basic engineering and science skills needed to develop their specific design, including familiarization with electronic laboratory instruments and construction techniques.

An introduction to assembly language and the C programming language will prepare the students for advanced computer engineering courses.

By the end of the course, the student will have had opportunities to further his/her professional development through working in teams, practicing written, oral and graphical communication skills, using modern computer tools and acquire an appreciation to engage in life-long learning

TEXTBOOK: Introduction to Engineering Analysis, by Kirk Hagen, Prentice Hall 2005

REFERENCES:

1. Macaulay, D., The Way Things Work, Houghton Mifflin Company, Boston, 1988.
2. Mayne, R., and S. Margolis, Introduction to Engineering, McGraw Hill, Inc., 1993.
3. Eck, David, The Most Complex Machine, A. K. Peters Publishing (1995).
4. Kidder, Tracy, "Soul of a New Machine", Little, Brown and Company 1981.
5. Sellinger, Carl, "Stuff You Don't Learn in Engineering School", IEEE Press, 2004.

Sequence of Topics

The course is 3 credits, with two 50 minute lectures and one 2 hour lab period each week.

Intro to the course, what is engineering, what is design. Dimensions, units, conversion, dimensional analysis, discuss the team design project. Societal issues: Social, professional, ethical responsibility, contemporary issues, skills needed to be an engineer such as problem solving and teamwork.

Intro to computer engineering and electrical engineering.
DC circuits, current, voltage, charge, Ohm's Law

Components (and what they look like): R, Diode, LED, Battery, transformer, AC and DC, C, L, transistor, IC . For the project, include motors, batteries, LED's, switch, relay, photodiode. Circuit simulator like pspice or circuitmaker.

Instrumentation - intro to the multimeter, power supply, signal generator , CRT and oscilloscope

Computer Organization, memory, CPU, ALU, disk, I/O, fetch-execute, machine language, binary numbers.

Operating Systems and Linux

C programming language – pointers, arrays, etc. What is an algorithm

Intro to digital logic, AND, OR, NOT.

writing and oral presentation skills throughout

LABS will cover the following subjects:

DC Circuit, voltage divider, multimeter, other instrumentation
Spice or Circuitmaker software tools

Motors, with some controls

Soldering techniques and construction of a kit (to be completed out of class).

TEAM PROJECT

There will be a team design and construction project

Subject: [Fwd: Re: [Fwd: Proposal for CMPE 101]]
From: Marie desJardins <mariedj@cs.umbc.edu>
Date: Tue, 13 Oct 2009 19:44:23 -0400
To: Tamara Brown <tbrown@umbc.edu>
CC: Marie desJardins <mariedj@cs.umbc.edu>

Tamara,

Here is a short message from John Pinkston, the faculty member who is proposing the new CMPE 101, about distribution of grades. Could you please add this information to the listing?

Thank you,
Marie

----- Original Message -----

Subject: Re: [Fwd: Proposal for CMPE 101]
Date: Mon, 12 Oct 2009 14:54:50 -0400
From: John Pinkston <pinkston@umbc.edu>
To: Marie desJardins <mariedj@cs.umbc.edu>
References: <4ACA2228.7020307@umbc.edu> <4AD0EEBE.9060708@cs.umbc.edu>

I think now that roughly exams 45% including the final, homework 10%, labs 20%, and project 25%. This could change, but probably not by more than 5% or so for each.

John