UNIVERSITY OF KENTUCKY
APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

1. Submitted by College of  Engineering ____________________________ Date 1/26/04
   Department/Division offering course  Electrical and Computer Engineering

2. Changes proposed:
   (a) Present prefix & number  EE 583  Proposed prefix & number  EE 383
   (b) Present Title  Microprocessors
       New Title  Introduction to Embedded Systems
   (c) If course title is changed and exceeds 24 characters (including spaces), include a sensible title (not to exceed 24 characters) for use on transcripts:
       Intro. to Embedded Sys.
   (d) Present credits: 3  Proposed credits: 3
   (e) Current lecture: laboratory ratio
   (f) Effective Date of Change: (Semester & Year)  Fall 2004

3. To be Cross-listed as:  CS 383  [Signature: Department Chair]

4. Proposed change in Bulletin description:
   (a) Present description (including prerequisite(s):
       See attachment.
   (b) New description:
       See attachment.
   (c) Prerequisite(s) for course as changed:  EE/CS 380

5. What has prompted this proposal?
   The development of the new Computer Engineering Degree program.

6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:
   None.

7. What other departments could be affected by the proposed change?
   Computer Science

8. Is this course applicable to the requirements for at least one degree or certificate at the University of Kentucky?
   ☐ Yes ☐ No

9. Will changing this course change the degree requirements in one or more programs?*
   If yes, please attach an explanation of the change.*
   ☐ Yes ☐ No

10. Is this course currently included in the University Studies Program?
    If yes, please attach correspondence indicating concurrence of the University Studies Committee.
    ☐ Yes ☐ No

11. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted.

*NOTE: Approval of this change will constitute approval of the program change unless other program modifications are proposed.
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12. Is this a minor change?  
   (NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)
   ☑ Yes  ☐ No

13. Within the Department, who should be consulted for further information on the proposed course change?
   Name: Dr. James Lump
   Phone Extension: 257 - 3895

Signatures of Approval:

[Signature]
Department Chair
Date: 2/2/04
Date of Notice to the Faculty: 11-16-04
Date

[Signature]
Dean of the College
Date: 4/1/04

[Signature]
Undergraduate Council
Date: 4/1/04

[Signature]
Graduate Council
Date

[Signature]
Academic Council for the Medical Center
Date

[Signature]
Senate Council
Date

Date of Notice to University Senate

**If applicable, as provided by the Rules of the University Senate.

ACTION OTHER THAN APPROVAL

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The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

a. change in number within the same hundred series;
b. editorial change in description which does not imply change in content or emphasis;
c. editorial change in title which does not imply change in content or emphasis;
d. change in prerequisite which does not imply change in content or emphasis;
e. cross-listing of courses under conditions set forth in Item 3.0;
f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Rev 8/02
Present description for EE 583:

A course in the hardware and software of microprocessors. Assembly language programming, address decoding, hardware interrupts, parallel and serial interfacing with various special purpose integrated circuits. Each student is expected to do homework assignments using microprocessor hardware. This will be arranged by special appointment through the instructor. Prereq: EE 280 and EE/CSE 380; engineering standing or upper division computer science standing.

New description for EE/CSE 383:

A course in the hardware and software of microprocessors. Assembly language programming, address decoding, hardware interrupts, parallel and serial interfacing with various special purpose integrated circuits. Each student is expected to do homework assignments using microprocessor hardware. Prereq: EE/CSE 380.
EE383
Introduction to Embedded Systems

COURSE POLICIES AND PROCEDURES
Fall 2006

Instructor: Prof. E. G. Professor
Office: 569 AH
Email: egp@engr.uky.edu (257-3333)
URL: http://www.engr.uky.edu/~egp
Lecture: TTh 2:00–3:15PM, 265 AH
TA: N. TA
Office: 551 AH
Email: nta@uky.edu

Course Text:

Required Reference Documentation:

Lab Supplies: Microcontroller Design Kit: M68EVB912B32 Evaluation Board (This kit includes all the above Reference Documents). It is highly recommended that if you have access to a PC outside of class, that you purchase an evaluation board so that you can work on the labs outside of the lab. You can purchase the kits from the IEEE Parts Store 560AH.

You will also need to purchase a parts kit for this course (some chips and resistors, breadboard, wire and a wire stripper, etc). The contents of the kit and when/where to get them will be discussed in class. Most of these parts will be available from the IEEE Parts Store 560AH.

1 Course Description

EE 383 is a hands-on course using microcontrollers to control physical systems. Lectures will cover the theory behind microcontroller architecture, programming, and interfacing and lab projects will back up that theory with actual implementations using microcontrollers. You will be expected to spend a considerable amount of time outside of lecture in the lab or at home experimenting with a microcontroller development board.
2 Course Content

Below is a tentative list of topics for this course.

Topics
- Paper Design of a One-Bus Architecture
- Implementation of a simple microprocessor core
- Lab introduction
- The 68HC11 and 68HC12 microcontrollers, the M68HC912B12 and the evaluation board
- Assembly language programming the 68HC12
- The DBug12 Monitor
- Test equipment of Embedded Systems
- Input and output devices and interfacing them to microcontrollers
- Real-time processing
- Final Project

3 Required Background

A background in digital design (EE280), computer architecture (EE380), digital laboratory work (EE481), and C programming is assumed. If you are unsure of your background please see me to discuss the course content.

4 Computer Accounts

Computer accounts where you can access the WWW are required. These can be unix, Mac or Windows machines as long as they are on the net and have web browsing software. If you do not have access to any appropriate machines talk to information desk in 280 AH. The Web page for the course is: http://www.engr.uky.edu/~ee383.html. You will also be issued computer ids in the embedded systems laboratory. The procedures for these accounts will be discussed in class.
5 Experiments

Students are encouraged to discuss the experiments with one another, however, students must submit only original work. Everything submitted for grading in this course with your name on it must be 100% original work. If any portion of submitted material is not original work, UK policy dictates that a failing grade for the course be assigned for all students involved. Failing the course is only the minimum penalty for more further details see the Students Rights and Responsibilities. If you are unclear on this policy please see me.

6 Lab Writeups

For each experiment done in this course you will prepare a writeup describing your pre-lab preparations and all work done in the lab.

For each lab, two things will be graded:

- pre-lab writeup (answers to pre-lab questions if there are any and a detailed description of your design)
- final lab writeup including TA signature sheet.

The pre-lab will consist of the following:

1. Name, experiment number/title, and the date
2. Answers to the pre-lab questions (if there are any)
3. Timing diagrams, truth tables, etc. that were used in the design
4. Any code written for the microcontroller or code for programmable logic
5. Chip level wiring diagram for your design with all signals labeled

Each team of two students should then work together on their implementation. The TA will check the operation of each circuit, verify that it meets the assigned functionality, and sign the verification sheet for each individual student.

For each lab, a due date for the signatures and writeups will be announced in class.

NO LATE LAB REPORTS OR LATE PRE-LABS WILL BE ACCEPTED AND THERE WILL BE NO MAKE-UPS FOR QUIZES.

The final writeup will consist of the following:

1. A brief summary of the experiment
2. A description of any deviations from the pre-lab and the reasons for the change
3. Tables or figures with any measurements taken during the experiment and a discussion of the results
4. A description of the final result (did it work, how well, why, why not) and a discussion of the optimality of your design (if your design was not optimal in chip/gate counts etc. why not)

5. The signature sheet

7 Practical

There will be one mid-semester practical and one final practical. Unless changed explicitly in lecture, the practicals will be scheduled as follows:

Practical 1: the week of 10/13/06
Practical 2: the week of 12/1/06

The format and content of the practicals will be discussed in class prior to each. There will not be a final exam.

8 Makeup Exams/Practicals

For those students who have verified conflicts, makeup exams will be arranged on an individual basis. In order to obtain approval for a conflict known ahead of time you must inform the instructor at least one week before the scheduled exam date. Verified conflicts are defined in the Students Rights and Responsibilities.

9 Extra Credit

No extra credit projects will be assigned or graded.

10 Grades

The raw percentage in the course will be based on the following weights:

Homework/Experiments : 50%
Quizzes/Class Participation : 10%
Practical 1: 20%
Practical 2: 20%

11 Re-grades

Re-grades incur a considerable amount of administrative overhead. In addition, they are unfair to the majority of students who accept the grade they receive. All assignments will be graded fairly, uniformly, and with great care. The students are expected to respect the
judgment of the teaching assistants in evaluating graded assignments. However, students should not be unfairly penalized by "human error," such as errors in totaling up scores on an exam questions. Therefore, the re-grade policy for this class is as follows. To submit graded material for re-grade, describe the mistake on a separate sheet of paper and attach the sheet to the exam or homework. The re-grade request must be submitted to the Prof. (not the TA) by noon the day after the exam or homework is returned. Furthermore, the request for re-grade will make the entire assignment open for re-grade, that is, ALL of the grading on a particular exam or homework in question can be checked for fairness and accuracy.

12 Course Outcomes

Students who fulfill the requirements for this course will have demonstrated:

1. an ability to design and implement a simple computer controlled devices.

2. an ability to write programs for a microprocessor in assembly language.

3. an ability to interface microprocessors to a variety of devices.

4. an ability to analyze and debug systems built around microcontrollers.

5. an understanding of the development of embedded systems controlled by modern microcontrollers and the capabilities and limitations of such systems.