TO: The Engineering Faculty
FROM: The Faculty of the School of Electrical and Computer Engineering
RE: Deletion of EE 365 and EE 467 and New Undergraduate-Level Course

The faculty of the School of Electrical and Computer Engineering has approved the following new course and attendant course deletions. This action is now submitted to the Engineering Faculty with a recommendation for approval.

Courses to be Deleted:

ECE 365 Introduction to the Design of Digital Computers
Sem. 1 and 2. Class 3, cr. 3.
Prerequisite: EE 362.

The hardware organization of computer systems including the following topics: Instruction set selection, arithmetic/logic unit design, hard wired and microprogrammed control schemes, memory organization, I/O interface design. The course will involve computer simulation of digital systems.

ECE 467 Advanced Digital Systems/Embedded Microcontroller Design Laboratory
Sem. 1 and 2. Lab. 3, cr. 1.
Prerequisite: EE 362.

Advanced topics in digital system design, focusing on use of programmable logic devices and highly integrated microcontrollers. Topics include use of programmable logic devices and their associated hardware/software development tools, and implementation of real-time control applications on an embedded microcontroller.

New Course:

ECE 437 Computer Design and Prototyping
Sem. 1 and 2. Class 3, Lab. 3, cr. 4.
Prerequisites: ECE 357 and ECE 362.

An introduction to computer organization and design, including instruction set selection, arithmetic logic unit design, datapath design, control strategies, pipelining, memory hierarchy, and I/O interface design.

Reason: The fundamental issues faced in computer design and prototyping are best taught when students are provided the opportunity to link concepts covered in lectures to the implementation of prototypes in a laboratory setup. The proposed new course addresses this goal by integrating two formerly disjoint lecture and lab courses.

Leah H. Jamieson
Professor and Interim Head

Supporting Documentation:

1. Justification: Computer design and prototyping are core aspects of computer engineering education. This course provides students the concepts, skills, and laboratory experience that they will need to use, analyze, design, implement, and evaluate micoprocessor systems.

2. Level: Undergraduate level

3. Prerequisites: EE 357 and EE 362
Prerequisites by topic: High-level language programming fundamentals; assembly language programming fundamentals; digital system design fundamentals; VHDL programming fundamentals; computer organization fundamentals; and data structure fundamentals.

4. Course Credits: Engineering Science - 2.0 credits
Engineering Design - 2.0 credits

5. Course Outline:

Topics	*Lectures*
Course introduction, computer performance evaluation	3
Computer instruction sets	3
Computer arithmetic	3
Processor datapath design	3
Processor control design	6
Review/Exam #1	3
Pipelining	6
Memory hierarchies	6
Review/Exam #2	3
More computer arithmetic	3
I/O fundamentals	3
Review	2
Final exam	
Total	44

Lab Exercises	*Labs*
VHDL/FPGA Review	6
Basic CPU Design, Simulation, and Prototyping	24
Extended CPU Design, Simulation, and Prototyping	14
Total	44

6. Text: Computer Organization and Design: The Hardware-Software Interface, 2nd Edition, J. L. Hennessy and D. A. Patterson, Morgan Kaufmann Publisher, 1997, ISBN 1558604286 (cloth), 155860491X (paper).

7. Web Site: The course lecture notes, on-line lecture videos, reference documents, lab manual, homework information, and exam information are available on the course web site at http://dsml.ecn.purdue.edu/ee437.