

Course Change Request

Indiana University

South Bend

Campus

Check Appropriate Boxes:

Undergraduate credit

Graduate credit

Professional credit

- 1. School/Division CLAS
- 2. Academic Subject Code: PHYS 3. Current Course Number: P303 4. Current Credit Hours: 1.0=3.0
- 5. Current Title: Digital Electronics
- 6. Effective Semester/Year for changes listed below: Fall 2003 7. Instructor: M. Lynker

Type of Change Requested (Check appropriate boxes and indicate changes)

- 8. Change course number to: (must be cleared with University Registrar)
- 9. Current course title:
Change to:
Recommended abbreviation (optional)
(Limited to 32 Characters including spaces)
- 10. Current credit hours fixed at: or variable from: 1.0 to 3.0
Change to credit hours fixed at: or variable from: 1.0 to 4.0
- 11. Current lecture contact hours fixed at: or variable from: to
Change to lecture contact hours fixed at: or variable from: to
- 12. Current non-lecture contact hours fixed at: or variable from: to
Change to non-lecture contact hours fixed at: or variable from: to
- 13. Is this course currently graded with S-F (only) grades? Yes No
Change to S-F (only) grading? Yes No
- 14. Does this course presently have variable title approval? Yes No
Is variable title approval being requested? Yes No
- 15. Is this course being discontinued? For all campuses or for this campus only
- 16. Current course description

Change course description to (not to exceed 50 words)

- 17. Justification for change to allow time for an introduction to basic principles of electricity for students with little or no previous instruction in physics courses (Use additional pages if necessary)
- 18. Are the necessary reading materials currently available in the appropriate library? Yes
- 19. A copy of every course change proposal must be submitted to departments, schools, or divisions in which there may be overlap of this course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by:

[Signature]

Department Chairman/Division Director

Date 28/1/03

Dean of Graduate School (when required)

Approved by:

[Signature]

Dear

Date 2/11/03

Chancellor/Vice-President

University Registrar

Date

After School/Division approval, forward the last copy (without attachments) to the University Registrar for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

Sample Syllabus

PHYS P303 – Digital Electronics Indiana University South Bend

Instructor: Monika Lynker, Assoc. Prof. of Physics, NS343, 237-6513, mlynker@iusb.edu

Prerequisites: MATH M115 or equivalent

Primary Text: Diefenderfer and Holton, Principles of Electronic Instrumentation, 3rd edition, Saunders College Publishing, 1994.

Objective: This course will cover some of the basics of analog and digital electronics in a very hands-on way. The only prerequisite for this course is MATH M115 or equivalent (e.g., level VI on the math placement exam).

We will start with a brief introduction to some basic characteristics of electric circuits, such as current and voltage, and to devices like resistors, capacitors, diodes, and transistors. Then we will go on to digital electronics. You will learn to read digital circuit diagrams and learn to design your own circuits. You will learn to find mistakes and fix them (trouble shooting... there will be a lot of that!). At the end of the semester you will be able to come up with a project of your own, build it and describe it in a brief (1-2 page) paper.

There will be about one hour of lecture each week. The rest of the scheduled time is for discussions of the week's assignments, both for labs and homework, and for work on the lab assignments. The lab room (NS0051) is open by assigned keypad code to students enrolled in the course, so if necessary you can finish labs at any time you wish. You are required to keep a lab notebook with a log of the procedures and results. This lab-book will serve to remind you of what is going on, and will help the instructor in evaluating and correcting what you are doing. Lab-books should be handed in about once a week.

Course Meetings: One 75-minute session (usually lecture) and one 3-hour session (for lab exercises) per week.

Exams: There will be several quizzes throughout the semester, and a final exam at the end.

Homework Assignments: Homework assignments will be made regularly, approximately twelve assignments over the course of the semester. Problem assignments and due dates will be announced in class. *Discussion* of homework with your classmates is allowed; *copying* of homework is *not allowed*, and *both parties will be penalized*. Discussion of homework assignments with the instructor is, of course, *encouraged*. A penalty will be assessed for late homework, and homework assignments will not be accepted more than two class meetings after the due date.

Grading: The course grade will be determined from exam and homework scores as follows:

Quiz average	-- 25%
Homework average	-- 25%
Lab performance	-- 30%
Final Exam	-- 20%

Topics to be covered:

1. Introduction
Resistors, capacitors
Ohm's Law, Kirchhoff's Rules
Reading circuit schematics
Diodes, transistors, operational amplifiers
2. Digital Gates
AND, OR, NAND, NOR, NOT, XOR
Truth tables
3. Boolean Algebra
Laws of commutation, association, distribution,
de Morgan
4. Number Systems and Representation
Decimal, Binary, Hexadecimal, Octal, ASCII, BCD
5. Sequential Circuits
Oscillators, Monostables
D-Type and J-K Type Flop-flops
Counters, Shift registers
6. Multiplexers, Demultiplexers (Decoders)
7. Tri-state
8. Devices such as Memory, Arithmetic Logic Unit, Adder
9. A/D and D/A conversion