

PHYCS 658 Introductory IC Digital Electronics Workshop for Teachers

Course Description

Laboratory-oriented course that acquaints teachers who do not have a strong electronics background with the uses of modern integrated circuitry. Emphasizes the construction and use of circuits that can be presented in the classroom. Introduces digital and micro-processor electronics topics. (2 credit hours)

Prerequisite: PHYC 112, 122, or permission of department chairperson.

Not open to students who have credit in PHYC 354, 356, 554, 556

Course Objective

The objective of this course is to provide science teachers with an opportunity to become proficient in using laboratory equipment, digital integrated circuits, and electronic simulation software. Also, it is designed to increase their understanding of digital electronic theory.

Course Rationale

Since the course strongly stresses applications of electronics, it is an appropriate course for all teachers in the physical sciences. This course fills a need for practicing teachers to update their knowledge of electronics.

Course Content, Format, and Bibliography

Content

- AND, OR, and NOT Gates
- Boolean Algebra and Combinational Logic
- Encoding and Decoding
- Multiplexing and De multiplexing
- Sequential Logic
- Cross Coupled NAND gates
- Data Latches
- Flip Flops
- Counters and Shift Registers
- Memories
- Digital to Analog Conversion
- Analog to Digital Conversion

Format

Lectures, Laboratory Experiments, Homework, Examination

Bibliography

The Art of Electronics by Paul Horowitz and Winfield Hill

Principles of Electronic Instrumentation by A. James Diefenderfer and Brian E. Holton