



Logical Design

CS 221

Prof. Dr. Mohamed Osama Khozium





Prof.Dr. Mohamed Osama Khozium

- Ph. D. I.S. “Faculty of Computers & Information”
Cairo University
- Title :

*Intelligent Information System for Jamming
and Anti-Jamming Applications of
Electromagnetic Spectrum*

- ♦ Ms.C.I. Institute of Statistical Studies & Research
Cairo University
- ♦ Title :

*Computer – Based System For Unmanned Air
Vehicle Mission Planning*





Dr. Mohamed Osama Khozium

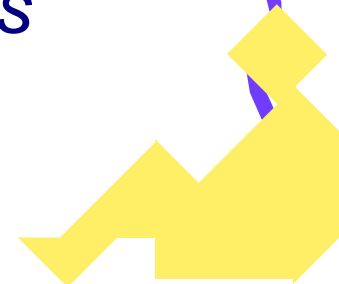
- Ms. M.Sc. “Aviation Academy”
- Title :

*Laser Applications in Electronic Warfare to
Secure Egyptian Air Force Missions*

◆ D.C.Sc.I. Institute of Statistical Studies & Research
Cairo University

◆ Title :

Data base system for World Countries





Lecture 1 : Logic Design Course overview



Agenda

- Logic design Background
- Course Team
- Required Textbook
- Course Outlines
- Course Requirements
- Course Time





Logic design Background

- Logic design is also known by other names such as : digital design, digital logic, switching circuits and digital systems





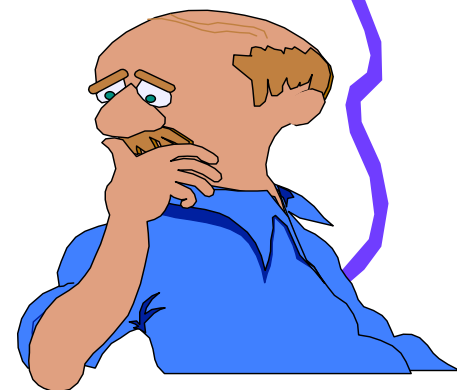
Course Team

Instructor: Prof.Dr Mohamed Osama Khozium

E-mail: osama@khozium.com

Assist :

E-mail :





Required Textbook

DIGITAL DESIGN

By

M.MORRIS MANO

Published by

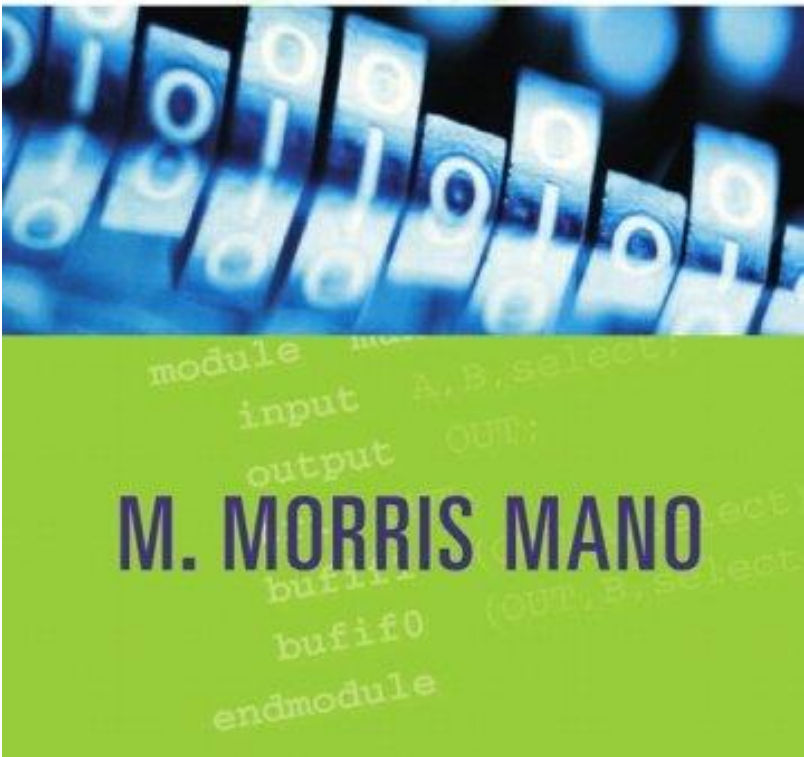
Prentice – Hall International Editions





DIGITAL DESIGN

THIRD EDITION





Course Outlines



- 1 - Numbering systems.**
 - a - Overview and definitions.
 - b - Decimal numbering systems.
 - c - binary numbering systems.
 - d - Octal numbering systems.
 - e - Hexadecimal numbering system.
- 2 - conversions between numbering systems including fractions**
- 3 - Binary arithmetic**
 - a - Binary additions
 - b - binary subtraction (one's and two's complements of binary numbers).
 - c - Binary tools





Course Outlines



4 - Simple logic circuits

Logic circuits (standard), truth tables, and Boolean expressions for :

- a - OR gate
- b - AND gate
- c - NOT gate
- d - NAND gate
- e - NOR gate
- f - Exclusive – OR gate (XOR – gate)
- g - Exclusive – NOR gate (XNOR – gate)

5 - Rules of Boolean algebra

- a - Basic rules
- b - The Boolean expression for a logic circuit
- c - Implementation of a logic circuit using a Boolean expression
- d - Implementation of a logic circuit via a truth table
- e - Converting Boolean expression to a truth table.
- F - Simplification of Boolean expression using Boolean algebra





Course Outlines

6 – Demorgan's theorems

- a - NAND gate as universal element
- b - NOR gate as universal element
- c - Sum of Product Σ
- d - Product of Sum Π

7 - Karnaugh Map

Simplification using Karnaugh map

8 - combinational logic circuits

- a - Half adder
- b - Full adder





Course Outlines

9 - Decoder, encoder and multiplexer

10- Sequential logic circuits

flip – flop types

a - set – reset FF

b - J-K FF

c - Delay FF

d -Trigger FF

11- Flip Flop applications

Registers – Counters

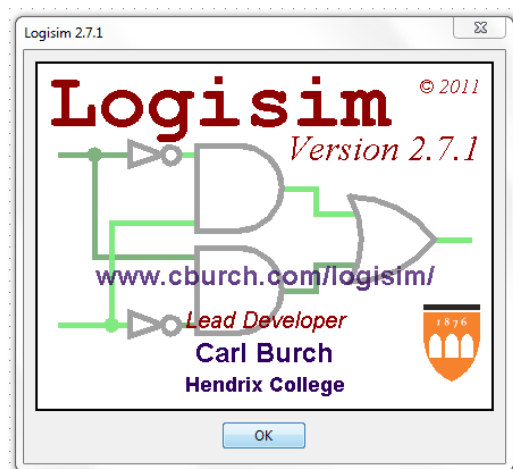




Practical Part

Training for :

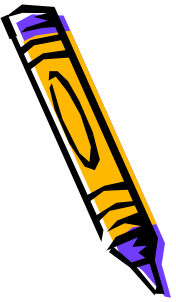
- * conversations
- * simplifications
- * Implementations
- * Simulation software (LOGISIM)





Course Requirements

- Ten lectures plus
 - Lecture in the beginning (overview)
 - Lecture in the end (any required questions)
- One week for mid term exam
- First quiz will be conducted during the beginning of sixth week.
- Midterm exam will be conducted during the beginning of the eighth week.





Term Assessment:

Class activity: [25%]

participation and attendance, homework: 10%

quizzes → 5%

Lab and exercise activities → 10%

Midterm Exam: 15%

Final written exam : 60%





Late Policy



- Late assignments will receive a 10% penalty per day ,
- * unless a Doctor's note is provided.
- * Thursdays & Fridays count as late days as well





Course Time

Lectures :

9-11 AM, 11-1PM, 1-3PM

o'clock Saturday

9-11 AM, 11-1PM, 1-3PM

o'clock Tuesday.



