Course Book

Subject: Digital Electronics-I

Class: second year

B.SC Degree in electrical engineering

Academic year 2014/2015

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Course objective

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The purpose of this course is to learn the numbering system and the identification of logic gates and to study ways to design logical circuits using these gates and a study of commonly used services such as adder, subtractor, multiplexer and de multiplexer

And finally identify the flip-flops and their use in circuits such as logical registers and counters

Form of Teaching

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For the teaching of the subject (Digital Electronics I) I use the whiteboard as well as the computer and use of cretin programs such as electronic workbench and Microsoft power point

In order to convey information well to the student follow the method of making the discussions during the lecture by posing some questions to the student or give students the opportunity to ask questions

Grading

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My teaching subject (digital electronics I) is the full year subject. Student are required to do one closed book exam at the end of each course, biased of the one quiz exam before each course exam

The grading is shown below:

• First course exam 17.5%

• First quiz exam plus student attendance / activities 2.5%

• Second course exam 17.5%

• Second quiz exam plus student attendance / activities 2.5%

• The average /year will be 40%and

• Final exam 60%

Course book

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As well as. I prefer electronic resources which are available because of internet access availability anywhere; the following text books are useful to enhance student scientific backgrounds:

- S.N.Ali, Digital Electronics-Circuits, Systems
- A.P. Godse Digital Techniques

Course program:

The subject (digital electronics I) is the full year subject

Week 1

- Course outline
- Introduction to digital electronics

Chapter 1

Week2

- Number system and codes

Week 3

- Basic Gates
- Basic Boolean

Week 4

- K- maps (continued)

Week 5

- Product of sum
- Sum of product

Week 6

- Logic circuit design (using K-map)

Week 7

- Solving problem on k- map

Chapter 2

Combinational Logic

Week 8

- Adder and subtracor circuits

Week 9

- Introduction to 1 bit error detection

Week 10

- Parity bit generator
- Parity bit tester

Week 11

- Introduction to 7 segment display
- Common anode display
- Common cathode display

Week 12

- 7 segment display drive circuit

Week 13

- Binary to gray conversion
- Gray to binary conversion

Week 14

- Introduction to comparator logic circuit

Week 15

- Magnitude comparator logic circuit

Week 16

- Multiplexer circuit
- De multiplexer circuit

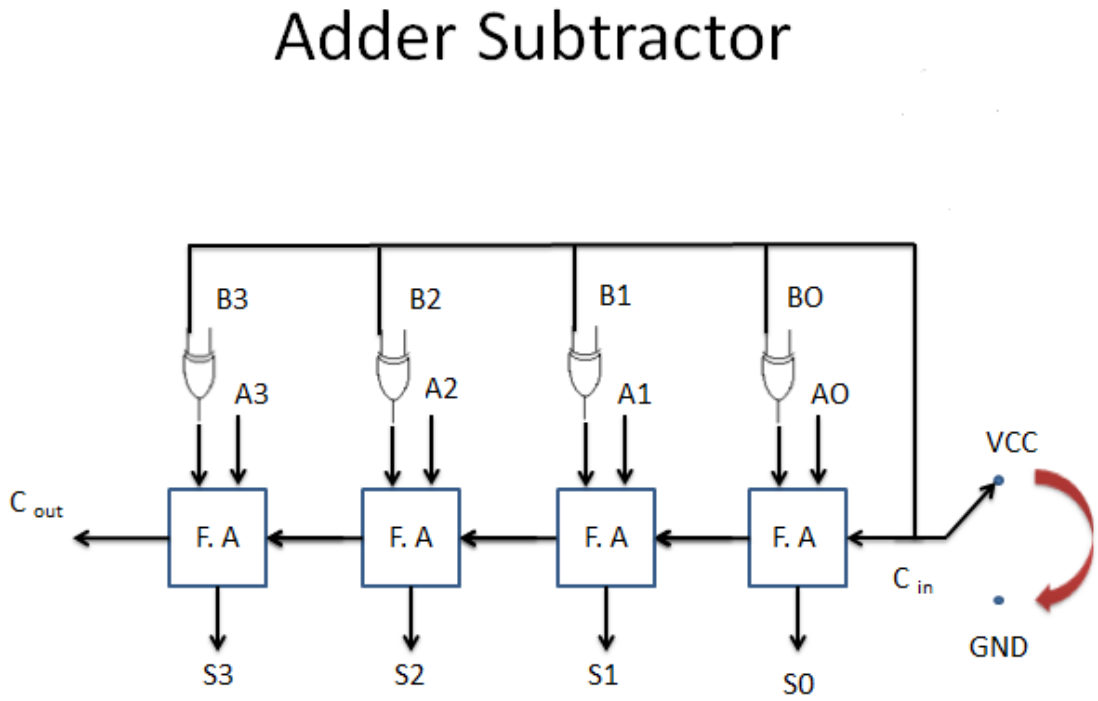
Week 17

- Expanding of multiplexer circuit

Week 18

- Solving problem on multiplexer circuit

Example



Chapter 3

Flip-Flops

Week 19

- Introduction to sequential logic circuit

Week 20

- Introduction to multivibrator circuit

Week 21

- Introduction to flip-flop construction

Week 21

- Sequential logic circuit design

Chapter 4

Registers & counters

Week 22

- Registers

Week 23

- SISO register
- SIPO register
- PISO register
- PIPO register

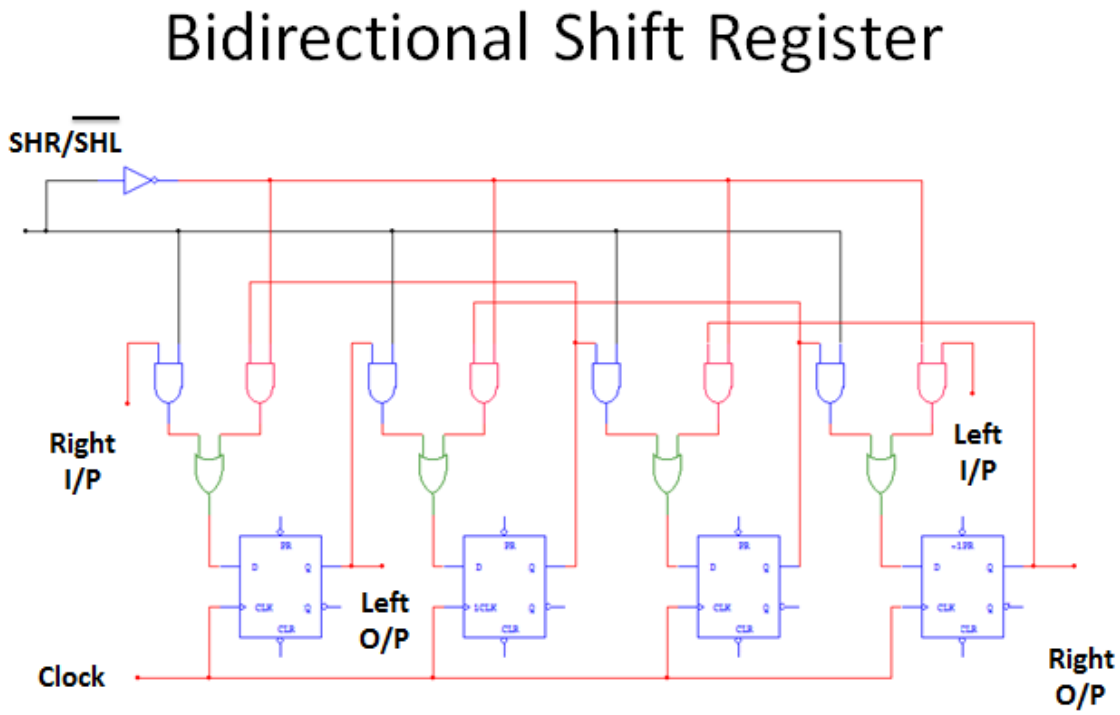
Week 24

- Solving problem on registers

Example

Design 4-bit bidirectional shift register

Solution



Wee 25

- Counters
- Types and construction

Week5 26

- Up counter
- Down counter

Week 27

- Up down counter

Week 28

- Ring counter

Week 29

- Johnson counter

Week 30

- Solving problem on counters

Example

Design 6-bit Ring counter

Solution

Ring Counter