

# ELEC3025 Integrated Circuit Design

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## Content

- An introduction to VLSI Design in CMOS

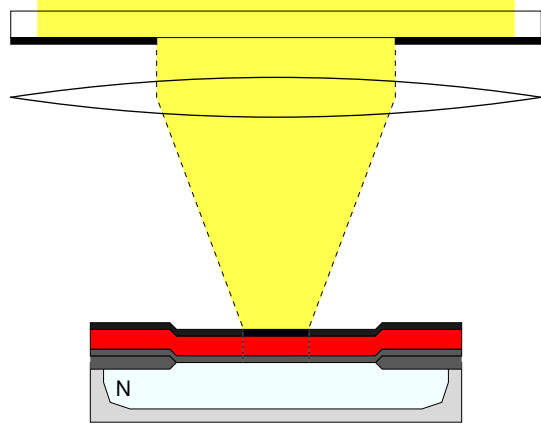
## Taught by

- Iain McNally
- Koushik Maharatna

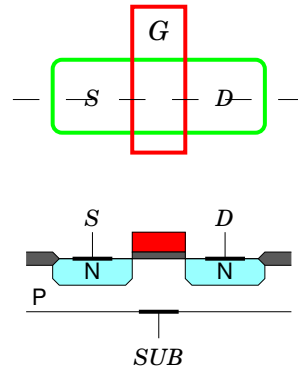
## Assessment

- |                                     |      |
|-------------------------------------|------|
| • Examination                       | 100% |
| • Informal Coursework               | 0%   |
| L-Edit Logic Gate Design and Layout |      |

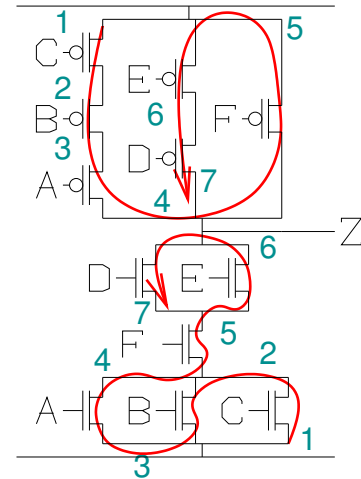
**Processing**



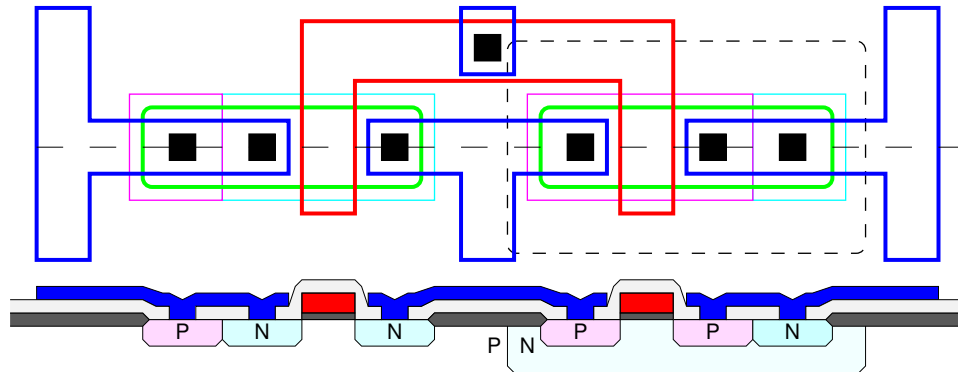
**Transistor Construction**



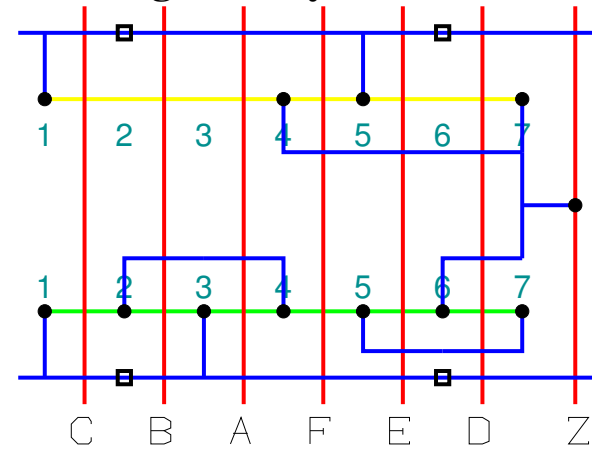
**Euler Path Design**



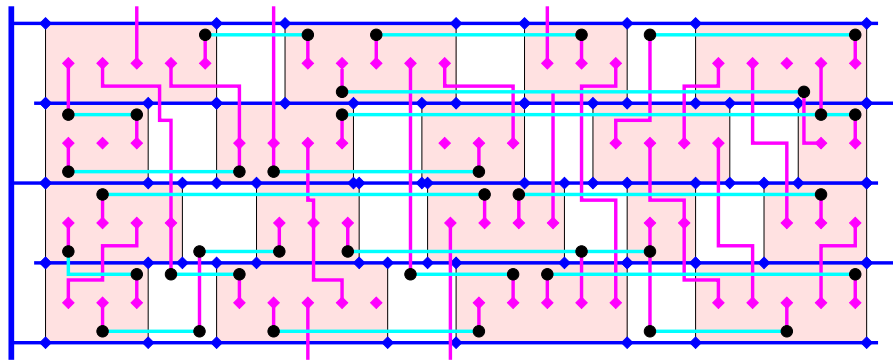
**Mask Level Circuit Design**



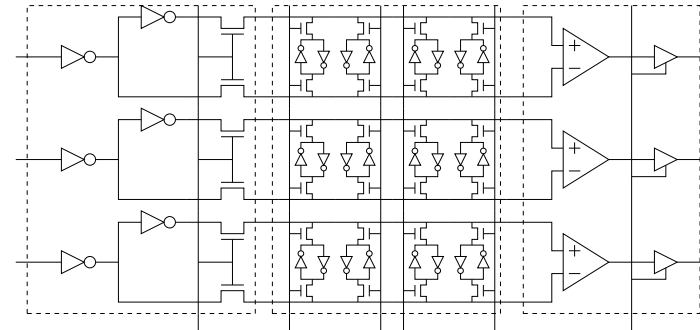
**Stick Diagram Layout**



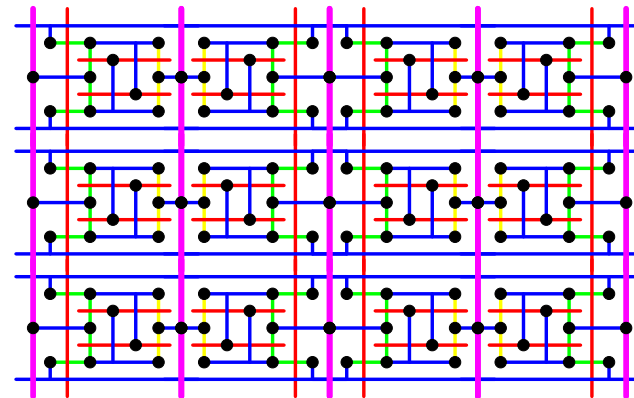
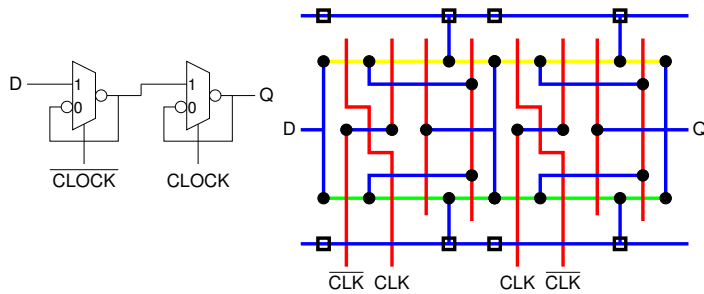
**System Design using Standard Cells**



**Structured Macros**



**Static CMOS Circuits**



For more details see:

<http://users.ecs.soton.ac.uk/bim/notes/icd>

- Inverter transfer characteristics, noise margins, SPICE simulation
- Transient response and transistor sizing, SPICE simulation
- Speed-area trade-off
- Circuit Power Consumption, design tradeoffs speed-power, introduction to low power circuit design
- Capacitance estimation, buffer design, area-speed design tradeoffs
- Dynamic logic

Part II

## D2 IC Design Exercise

Simple Digital System Design using "Black Box" Standard Cells

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Part III

## ELEC3025 Integrated Circuit Design

An Introduction to VLSI Design in CMOS

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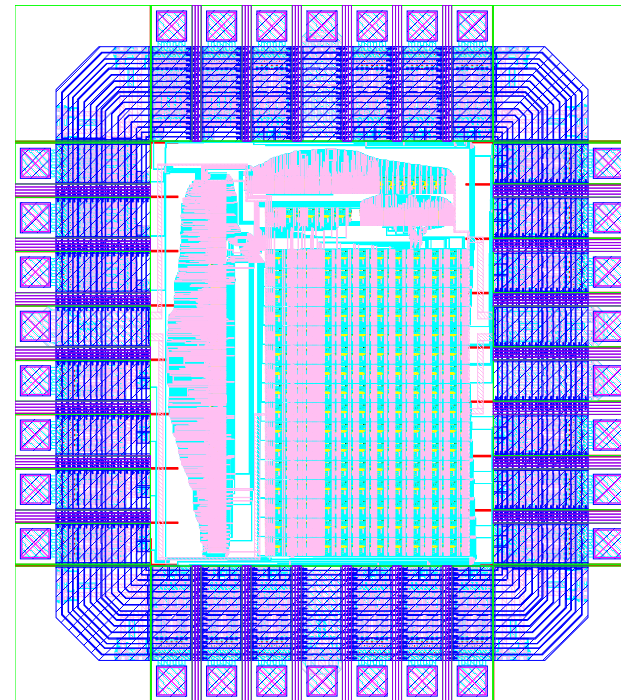
Part IV

## ELEC6010 Digital IC Design

Lots of hands-on CAD

## ELEC6027 VLSI Design Project

Complex System Design  
Complete Custom IC Design Flow



**ELEC6027 Novel 16-bit Microprocessor**  
**(The best design from each year is fabricated)**