CS2022 Exam

- 4 Questions
- You must answer 3 questions
Questions will seek to establish that you have a good grasp of the following concepts:

- Microoperations
- Datapath
- Busses
- Alu/shift design
- Status bit generation and use
- Control unit design and operation
Course Text:

- “Introductory VHDL: From Simulation to Synthesis”
- “Logic and Computer Design Fundamentals” 2nd Edition updated, Mano (includes Xilinx Student Edition 4.2i software)
Organisation of the Course

Lectures:
- Relate to chapter 7 and 8 of Mano & Kime textbook
- Prerequisite:
  - Chapter 1-6 of Mano & Kime textbook

Tutorials:
- Will largely be problems from Mano & Kime textbook and the two projects.

Projects:
- There will be two in which you will be asked to design and simulate key elements of a processor.
Assessment

- By examination and coursework
- Ratio 80% to 20% respectively
The aim is to give you a good understanding of the design and operation of an instruction processing unit and the functional subsystems which execute these instructions.
This design was first specified by John von Neumann in 1940 and so the resulting architecture is often called the ‘von Neumann’ architecture.

Please see the following web page:

http://www-gap.dcs.st-and.ac.uk/~history/Mathematicians/Von_Neumann.html
John von Neumann

Born: 28 Dec 1903 in Budapest, Hungary
Died: 8 Feb 1957 in Washington D.C., USA
Datapath and Control Unit

Control Unit
- Determines Sequence of Operations
- Control inputs
- Control outputs

Datapath
- Performs Data-processing Operations
- Data inputs
- Data outputs

Control signals
- Status signals