

## Computer Organization

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## Computer Organization

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- High-level study of hardware.
- Focus on relationship between hardware design and
  - software (Operating System and Applications)
  - performance
  - cost

## Topics

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- Overview of Operating Systems
  - Unix
  - Handling multiple processes
- Making use of Operating System Services
  - C Programming for Unix

## Topics

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- Performance
  - parameters, measurements, estimates
- Logic Design
- Instruction Sets
  - Assembly Language Programming

## Topics

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- Computer Arithmetic
- Datapath and Control
  - Building an instruction interpreter in hardware
- Pipelining
  - Overlapping instructions
- Memory Organization
  - Cache design

## Topics

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- Buses
  - Peripherals
- Multiprocessing
  - Multiple processors
- Case Studies (organization of real processors).

## The Book

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- Very widely used!
- Each Chapter Includes:
  - Real Stuff
  - Fallacies and Pitfalls
  - Big Picture
  - Key terms

## Grading

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- 2 Tests (15% each).
  - Oct 11<sup>th</sup>    Nov 20<sup>th</sup> (typo in syllabus – not Oct 20)
- Homework (40% total)
  - Some small assignments
  - Some medium-large programming projects
- Final Exam (30%)
  - put it all together

## Homework

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- Must be done individually unless assigned as a group project.
- Discussion is great, but no sharing of answers/code.
- My hobby is catching cheaters – check out my web site:
  - [www.catchingandfailingcheaters.com](http://www.catchingandfailingcheaters.com)

## 170 Homeworks \* ?

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- It will take a while to grade all the homeworks...
- It will not be possible to be very flexible with deadlines.
  - extensions are possible, but not at the last minute! Ask ahead of time (at least 6 months before project due date).

## Possible Homework Assignments

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- C Programming (interface with Unix kernel via system calls).
- Logic Design project.
- Assembly Language Programming.
- Datapath and Control Design.
- Develop benchmarks.
- Write programs to make best/worst use of pipeline and memory hierarchy.

## Getting Help

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- email: [comporg@cs.rpi.edu](mailto:comporg@cs.rpi.edu)
  - 4 people will ~~ignore~~ see it!
  - At least one will respond soon!
- FAQs: questions and answers for each project will be available on the course home page.

## How to do well

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- If you don't think a topic is "relevant", say so (at a minimum you will feel better for speaking your mind).
- Dave thinks he is funny – laugh at his jokes.
- Put all personal relationships on hold for the semester.
- Get a large coffeemaker.
- Bring a TA a cookie now and then.