

TCSS 372A

Computer Architecture

Fall 2006

Class Times: MW 2:00 – 4:15 Cherry Parkes 105
Supporting Laboratory: Cherry Parkes 206D

Website: <http://faculty.washington.edu/lcrum>

| | |
|---------------|---|
| Instructor: | Professor Larry A. Crum |
| E-mail: | lcrum@u.washington.edu |
| Phone: | (253) 692-5866 |
| Office: | Cherry Parkes 224 |
| Office Hours: | MW 4:15 – 5:00; <i>Appointment recommended for other times.</i> |
| Text: | Computer Organization & Architecture - Designing for Performance Seventh Edition (2006) Williams Stallings Pearson Prentice Hall ISBN-10: 013-185644-8, ISBN-13: 978-013-185644-8 Website: http://williamstallings.com/COA/COA7e.html |

TCSS 372 Computer Architecture Catalog Description:

TCSS 372A covers the micro architecture level of machine design and advanced architecture features for performance enhancement. Subjects include I/O, bus, memory and CPU design, hardware support for operating systems, CISC/RISC architectures, embedded systems, and parallelism. Extends the understanding of systems programming. (5 credit hours)

Prerequisites: TCSS 371; TCSS 342.

References:

Introduction to Computing Systems, from bits & gates to C & beyond (2nd Edition), Yale N. Patt & Sanjay J. Patel, McGraw Hill, 2004

Computer Architecture, Fourth Edition: A Quantitative Approach, John L. Hennessy, David A. Patterson, Morgan Kaufmann, 2006 (or Third Edition)

Computer Organization and Design: The Hardware/Software Interface (3rd Edition), John L. Hennessy, David A. Patterson, Morgan Kaufmann, 2004

Digital Design: Principles and Practices Package (4th Edition), John F. Wakerly, Prentice hall, 2005

The Art of Electronics (2nd Edition), Paul Horowitz and Winfield Hill, Cambridge press, 1989

Grading:

Midterms (40%), Home Work and Lab (20%), Final Exam (30%), Class Contribution (10%)

Characteristics of an A student – Work is consistently outstanding in quality and displays particular insight and creativity. It is consistently presented with exceptional clarity and completeness. (S)he shows academic leadership in class discussions and contributes to others understanding and learning.

Characteristics of a B student – Work is consistently complete, the predominance of it is correct, it shows understanding of the material, and it is presented professionally and clearly. (S)he makes regular contributions to class discussions. (S)he is well prepared to use the material in the next course.

Characteristics of a C student – Work is basically complete and correct, and it is presented coherently and completely. (S)he is prepared to use the material in the next course but will likely need additional study in the area. (S)he participates in class discussions.

Plagiarism:

Students are encouraged to collaborate regularly with colleagues to gain a deep understanding of the material, and to gain insight on options for problem solutions. Solutions submitted are to display individual knowledge and accomplishment. *Any significant contribution in a submission must be acknowledged and the responsible student or source given due credit.* See <http://depts.washington.edu/grading/issue1/honesty.htm>

Laboratory:

We will complete approximately four hands-on projects in our laboratory (CP 206D). You will have access to the lab anytime of your choosing. **See Laboratory Etiquette reference.**

Schedule (Subject to adjustment):

| Week | Topics Covered | Preparations for Class (Chapters) | Homework/Projects (Due the Following Monday) |
|-----------------------------|--|--------------------------------------|--|
| 0: Sep 27 | Introduction, Review, & Overview | Pratt & Pratt text | |
| 1: Oct 2 Oct 4 | Buses | Chap 3.3 – 3.7 | 3.8, 11, 12, 15, 19 (due 10-9) |
| 2: Oct 9 Oct 11 | Cache memory | Chap 4 | 4.1, 5, 11, 23 (due 10-18) Lab Project 1 (due 11-1) |
| 3: Oct 16 Oct 18 | Int / Ext Memory | Chap 5 | 5.2 ,4, 7 ,8, 11, 12 (due 10-23) |
| 4: Oct 23 Oct 25 | I/O | Chap 6 Chap 7 | 6.3, 4 (due 10-30) |
| 5: Oct 30 Nov 1 | Operating System Support | Midterm 1 Chap 7 | 7.13, 18 (due 11-8) |
| 6: Nov 6 Nov 8 | Processors | Chap 8 Chap 11.2, 11.4 | 8.8, 15, 17 (due 11-13) 11.4, 5, 13, 16 (due 11-15) |
| 7: Nov 13 Nov 15 | RISC Processors | Chap 12 Chap 13 | 12.4a, 12.7, 12.10 (due 11-20) Lab Project 2 13.6, 13.7 (due 11-20) |
| 8: Nov 20 Nov 22 | Superscalar Processors | Chap 14 Midterm 2 | |
| 9: Nov 27 Nov 29 | IA-64 Processor Predication & Speculation | Chap 14 & 15 Chap 15 | 14.1, 14.5 (due 12-4) |
| 10: Dec 4 Dec 6 | Control units & Microprogramming | Chap 16 & 17 Reflection on course | Lab Project 2 Report due 12-8 |
| 11: Dec 10 | Final Exam 2:00 – 4:15 | | |

Safety Escorts: Safety escorts are available to accompany you to your vehicle 24 hours a day, 7 days a week. Call Campus Safety at **2-4416** from a campus phone, and **253-692-4416** from a non-campus phone.

Reporting Emergencies: From campus phones, report emergencies by dialing **9-911** and state the T-number that is on a sticker on the phone; from non-campus phones dial **911**. Building location numbers are posted on all buildings. For assistance with non-emergencies call Campus Safety at **2-4416** from a campus phone, and **253-692-4416** from a non-campus phone.

Emergency Procedures: In case of emergency, follow your professor’s instructions. When an alarm sounds, evacuate the building immediately. MATT, CP, WG, GWP, and BB buildings assemble in the Cragle Parking Lot south of the library. BHS, WCG, and DOU buildings assemble near the transit station next to the Pinkerton Building on Broadway (across from Spaghetti Factory). Pinkerton occupants go to the convention center parking lot north of Pinkerton. For more information about emergency procedures and information, please go to: <http://www.tacoma.washington.edu/safety/>

Disability Support: If you would like to request academic accommodations due to a temporary or permanent disability, contact Lisa Tice, Manager for Disability Support Services (DSS) in the Mattress Factory Bldg, Suite 206. An appointment can be made through the front desk of Student Affairs (692-4400), through Student Development and Success (692-4501), by phoning Lisa directly at 692-4493 (voice) or 692-4413 (TTY), or by e-mail ltice@u.washington.edu. Appropriate accommodations are arranged after you’ve conferred with the DSS Manager and presented the required documentation of your disability to DSS.