

**EE275, Advanced Computer Architecture
Fall 2017**

Instructor:	Dr. Tri Caohuu
Office Location:	ENG 375
Telephone:	408-924-3951
Email:	tri.caohuu@sjsu.edu
Office Hours:	MW 14:00 – 15:30
Class Days/Time:	MW 18:00 to 19:15
Classroom:	DMH 149B
Prerequisites:	EE270

Course Description

Performance metrics, instruction set architectures, instruction pipelining and pipeline hazards, instruction-level parallelism, multithreading, cache and virtual memory, I/O performance and advanced topics in storage systems, topologies and hardware/software issues of interconnection networks.

Required Texts/Readings

Textbook

J.L. Hennessy and D.A. Patterson, *Computer Architecture: A Quantitative Approach*, 5th Ed., Morgan Kaufmann, 2012, ISBN-10: 012383872X, ISBN-13: 978-0123838728 (Required)

Other Readings

D.A. Patterson and J.L. Hennessy, *Computer Organization and Design*, 4th Ed., Morgan Kaufmann, 2011, ISBN-10: 0123747503 | ISBN-13: 978-0123747501 (Reference)

Classroom Protocol

- Students are encouraged to ask questions in the class.
- Each student is required to engage in classroom activities, submit assignments and reports on time, *and* take exams and tests on time.
- Web-browsing in class is not allowed. Cell Phones are to be turned off during lectures and tests. During exams if you receive a cell phone call or page it will be

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assumed that you have completed your exam and no further work will be allowed.
(More details in “Additional Policies and Procedures” section)

- No make-up exams will be held.
- Student causing disruption in the class will be asked to leave the class

E-Learning Platform

All course materials, including lecture slides and course assignments, are hosted by San Jose State University’s chosen e-learning platform – Desire2Learn (D2L). You can go to site: <https://sjsu.desire2learn.com/> to log into your account. If you don’t know your login information yet, see the resources for students: <http://www.sjsu.edu/ecampus/students/>

Students are encouraged to use the D2L discussion boards that have been created for collaboration.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the [current academic calendar](http://www.sjsu.edu/provost/Academic_Calendars/) web page at http://www.sjsu.edu/provost/Academic_Calendars/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

Assignments and Grading Policy

Homework/Quiz/Participation	10%
Project	25%
Midterm Exam	25%
Final Exam	40%

The instructor reserves the right to change the percentages

Failure to complete and submit 90% of homework and project assignments will result in a failing grade in this class.

Notes:

Homework assignments are due one week from the assigned date. Late homework will not be accepted.

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Grading

Grade	Overall Score
A+	95-100
A	90-94
B+	85-89
B	80-84
C+	75-79
C	70-74
D+	65-69
D	60-64
F	0-59

Late Penalty

Assignments submitted after the deadline carry 10% deduction every day.

Makeup Exam

NO makeup exams will be given unless you have documented compelling reasons.

University Policies

Academic integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The [University's Academic Integrity policy](http://www.sjsu.edu/senate/S07-2.htm), located at <http://www.sjsu.edu/senate/S07-2.htm>, requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Integrity Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the

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[Disability Resource Center](http://www.drc.sjsu.edu/) (DRC) at <http://www.drc.sjsu.edu/> to establish a record of their disability.

Student Technology Resources (Optional)

Computer labs for student use are available in the [Academic Success Center](http://www.at.sjsu.edu/asc/) (<http://www.at.sjsu.edu/asc/>) located on the 1st floor of Clark Hall and in the Associated Students Lab on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library.

A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include DV and HD digital camcorders; digital still cameras; video, slide and overhead projectors; DVD, CD, and audiotape players; sound systems, wireless microphones, projection screens and monitors.

SJSU Peer Connections (Optional)

The Learning Assistance Resource Center (LARC) and the Peer Mentor Program have merged to become Peer Connections. Peer Connections is the new campus-wide resource for mentoring and tutoring. Our staff is here to inspire students to develop their potential as independent learners while they learn to successfully navigate through their university experience. Students are encouraged to take advantage of our services which include course-content based tutoring, enhanced study and time management skills, more effective critical thinking strategies, decision making and problem-solving abilities, and campus resource referrals.

In addition to offering small group, individual, and drop-in tutoring for a number of undergraduate courses, consultation with mentors is available on a drop-in or by appointment basis. Workshops are offered on a wide variety of topics including preparing for the Writing Skills Test (WST), improving your learning and memory, alleviating procrastination, surviving your first semester at SJSU, and other related topics. A computer lab and study space are also available for student use in Room 600 of Student Services Center (SSC).

Peer Connections is located in three locations: SSC, Room 600 (10th Street Garage on the corner of 10th and San Fernando Street), at the 1st floor entrance of Clark Hall, and in the Living Learning Center (LLC) in Campus Village Housing Building B. Visit [Peer Connections website](http://peerconnections.sjsu.edu) at <http://peerconnections.sjsu.edu> for more information.

SJSU Writing Center (Optional)

The SJSU Writing Center is located in Suite 126 in Clark Hall. It is staffed by professional instructors and upper-division or graduate-level writing specialists from each of the seven SJSU colleges. Our writing specialists have met a rigorous GPA requirement, and they are well trained to assist all students at all levels within all

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disciplines to become better writers. The Writing Center staff can be found at <http://www.sjsu.edu/writingcenter/about/staff/>.

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Course Schedule

The tentative schedule is subject to change

Week	Topics	Textbook
1 8/23	Class introduction	
2 8/28,30	Fundamentals of Quantitative Design and Analysis	Chapter 1
3 9/4,6	Labor Day Fundamentals of Quantitative Design and Analysis	Chapter 1 Appendix A
4 9/11,13	Fundamentals of Quantitative Design and Analysis	Appendix A Appendix B
5 9/18,20	Instruction set principles. Instruction set principles (A1&A2)	Appendix B Chapter 2
6 9/25,27	Review of Memory Hierarchy (B1&B2)	Chapter 2
7 10/2,4	Memory Hierarchy Design	Appendix C
8 10/9,11	Pipelining: Basic and Intermediate Concepts	Chapter 3
9 10/16,18	Instruction-Level Parallelism and It's Exploitation	Chapter 3
10 10/23,25	Review for Midterm MIDTERM 10/25	
11 10/30,11/1	Instruction-Level Parallelism and It's Exploitation	Chapter 5

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Week	Topics	Textbook
12 11/6,8	Thread-Level Parallelism (5a)	Chapter 5
13 11/13,15	Thread-Level Parallelism (5b)	Chapter 4
14 11/20,22	No-instruction day Data Level Parallelism in Vector, SIMD, and GPU Architecture (4a)	Chapter 4
15 11/27,29	Data Level Parallelism in Vector, SIMD, and GPU Architecture (4b)	Chapter 4
16 12/4,6	Data Level Parallelism in Vector, SIMD, and GPU Architecture (4b) cont.	
17 12/11	Review for Exam	
12/13	December 13th ,Wednesday. 17:15-19:30 FINAL EXAM	