

CS Systems Qualifying Exam 2016

Important Dates

- **May 6:** Registration ends. Registration instructions are below. When you register, you must declare the three exams you plan to take.
- **May 23:** Exams. Candidates will take exams during the week starting Monday, May 23rd. For oral exams, students are responsible for scheduling an exam with the examiner. We will schedule the written exams.
- **May 30:** Grading complete. Faculty members email grades for all exams to James Landay.
- **May 31:** Faculty meet to decide on final grades (9:30-11 AM). All systems faculty are invited.
- **June 1:** Announce. Decisions emailed to students and advisors. You should only take the Systems Qualifying Exam if your adviser is a “Systems Faculty” member. Students without a Systems Faculty adviser may request to take the exam, but you need the permission of your advisor and James Landay.

Exams

- Architecture: Kunle Olukotun
- Compilers: Monica Lam
- Databases: Hector Garcia-Molina
- Graphics: Pat Hanrahan
- Human Computer Interaction: James Landay
- Networking: Sachin Katti
- Operating Systems: Dawson Engler
- Programming Languages: John Mitchell
- Security: Dan Boneh

Registration

Send an email to James Landay <landay@stanford.edu> indicating which of the three exams you wish to take.

Architecture Qualifying Exam

Details and Reading List

Examiner: Kunle Olukotun

This qual will cover any ideas, topics and reading covered in the following courses:

- EE282: Computer Systems Architecture
- EE382A: Advanced Processor Architecture
- CS315A: Parallel Computer Architecture and Programming

You will be expected to be very conversant with the key ideas in computer architecture: Levels of abstraction (e.g. ISA→processor→RTL blocks→gates), pipelining, caching, prediction, virtualization and parallelism. As someone taking the architecture qual, you will be expected to have a fairly sophisticated knowledge of these topics.

Reading: Computer Architecture: A Quantitative Approach, 3rd Edition , Hennessy & Patterson.

Format

30 minute oral exam.

Scheduling

Arrange with Kunle Olukotun <kunle@stanford.edu>

Compilers Qualifying Exam

Details and Reading List

Examiner: Monica Lam

Principles, Techniques, & Tools (Second Edition), Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Addison Wesley, 2007.

Format

Oral or written exam, depending on the number of exam takers.

Scheduling

Contact Monica Lam <lam@cs.stanford.edu> directly.

Databases Qualifying Exam

Details and Reading List

Examiner: Hector Garcia-Molina

H. Garcia-Molina, J.D. Ullman, and J. Widom

Database Systems: The Complete Book (Second Edition) Prentice Hall, 2009

All chapters

Format

The Database portion of the Systems Qual is a one hour, open book written exam.

Topics covered:

Data models and query languages. Database design, building database applications.

File structures, indexing, and hashing methods. Query processing and optimization.

Transactions, concurrency control and recovery, security and authorization, database performance. Material as covered in CS145 and CS245.

[Previous Quals](#)

Scheduling

Contact Hector Garcia-Molina <hector@cs.stanford.edu>

Graphics Qualifying Exam

Details and Reading List

Examiner: Pat Hanrahan

Knowledge of basic representations of surfaces and solids, scan conversion algorithms, geometric transformations, viewing projections, visible surface determination, and shading models, as covered in CS 148 and 248. Understanding of basic issues in input and display hardware, graphics software, and user interface design. Some knowledge in depth of either curve, surface, and solid modeling and geometric algorithms at the level of CS 348A, or of sampling, filtering, and local and global illumination methods at the level of CS 348B.

Reading list:

Typical references for the material in 248, 348A, and 348B, are the online course notes, where available:

- For 148: P. Shirley,, Fundamentals of Computer Graphics, 2nd Edition, A. K. Peters, 2006
- For 248: E. Angel, Interactive Computer Graphics (5th ed.)
- For 348A: G. Farin, Curves and Surfaces for Computer Aided Geometric Design Academic Press, (2nd edition)
- For 348B: M. Pharr and G. Humphreys, Physically Based Rendering. Morgan Kaufman.

Format

30 minute oral exam.

Scheduling

Contact Pat Hanrahan <hanrahan@cs.stanford.edu>

Human Computer Interaction Qualifying Exam

Details and Reading List

Examiner: James Landay

Knowledge from CS147 and CS247.

Reading list from CS376.

Format

30-60 minute oral exam

Scheduling

Contact James A. Landay <landay@cs.stanford.edu>

Networking Qualifying Exam

Details and Reading List

Examiner: Sachin Katti

The reading list from CS244: <http://web.stanford.edu/class/cs244/timetable.html>

Format

The exam is an oral examination with Sachin Katti.

Scheduling

Contact Sachin Katti <skatti@stanford.edu>

Operating Systems Qualifying Exam

Details and Reading List

Examiner: Dawson Engler

Reading list from CS240: <http://cs240.stanford.edu>

Format

30 minute oral exam.

Scheduling

Contact Dawson Engler <engler@stanford.edu>

Programming Languages Qualifying Exam

Details and Reading List

Examiner: John Mitchell

Knowledge including and extending beyond the principles and central concepts in programming language, as covered in CS 242. Students taking the Systems Qual in programming languages are expected to have a professional-level conversational competency in the main design and implementation topics associated with programming languages, applied to languages and situations you know and those you may not.. Sophistication beyond the preparation provided by CS242, typically gained by practical experience and participation in software systems research, is expected.

Format

30-45 min oral exam.

Scheduling

Contact John Mitchell <John.Mitchell@stanford.edu>

Security Qualifying Exam

Details and Reading List

Examiner: Dan Boneh

Format

<http://seclab.stanford.edu/SecurityQual.html>

Scheduling

<http://seclab.stanford.edu/SecurityQual.html>