

# Welcome to CS 241 Systems Programming



University of Illinois at Urbana-Champaign

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## What's my End Result?

**Before** CS 241: 😞

**After** CS 241:

- Can design and code interesting applications:
  - Simple Web servers
  - Internet multiplayer games
  - Chatrooms, instant messaging software

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## The Team

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### **Tarek Abdelzaher (Instructor)**

- Office: 4126 SC
- Office Hours: Thu 9-10am, Fri 11-12noon,
- Tel: (217) 265-6793
- [zaher@cs.uiuc.edu](mailto:zaher@cs.uiuc.edu)

### **Lawrence Angrave (Instructor)**

- Office: 2217 SC
- Office Hours: Mon 3-4pm, Fri 3-4pm,
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**TAs:** Lucas Cook, Stephen Kloder

- e-mail: [cs241help@uiuc.edu](mailto:cs241help@uiuc.edu)



## The Team

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### **Tarek Abdelzaher (Instructor)**

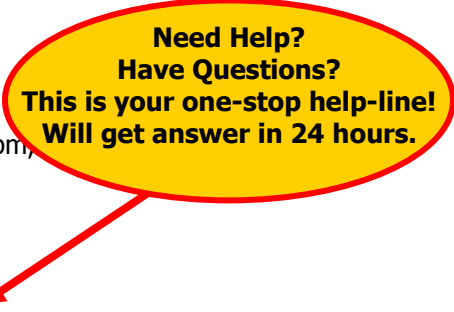
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**Need Help?  
Have Questions?  
This is your one-stop help-line!  
Will get answer in 24 hours.**



## Newsgroups

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- We encourage discussion on classroom issues
- Please subscribe to these newsgroups:
  - **class.cs241** (general discussion)
  - **class.cs241.announce** (announcements)



## The Textbook

Coming soon (not in stored yet)...

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**Introduction to Systems Concepts and Systems Programming**  
**University of Illinois Custom Edition**  
**Copyright © 2007**  
**Pearson Custom Publishing**  
**ISBN 0-536-48928-9**

Taken from:

*Operating Systems: Internals and Design Principles*, Fifth Edition  
by William Stallings

*UNIX™ Systems Programming: Communication, Concurrency, and Threads*  
by Kay A. Robbins and Steven Robbins

*Computer Systems: A Programmer's Perspective*  
by Randal E. Bryant and David R. O'Hallaron



## Your CS 241 "Mission"

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- Come to class, MWF, 10-10:50am
  - Please participate actively...
- Sign up for one discussion section per week (starting next week)
  - Discussion section times will be announced at the end of this week
- Read textbook
  - Reading assignments posted on webpage (none this week)
- Do 2 homeworks
- Code 6 Short programming assignments (in teams of 2)
  - Short Machine Problems (SMPs)
- Code 2 Long programming assignments (in teams of 2)
  - Long Machine Problems (LMPs)
- Take Midterm, Wednesday 10/17
- Take Final (finals week)

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## Grading

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- **Final Exam: 30%**
- **Mid-term Exam: 20%**
- **Homework (two total): 10%**
- Team **Machine Problems (8 total): 30%**
  - 6 Short Machine Problems (SMPs) @ 3%
  - 2 Long Machine Problems (LMPs) @ 6%
- **Participation: 10%**
  - Class involvement
  - Pop quizzes

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## Please...

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- No late homework/MP submissions
- 1 week window for re-grades from return date



## Introduction

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- What is an operating system?
- What is it for?
- What is system programming?



## Course Objectives

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- Identify the basic components of an operating system, describe their purpose, and explain how they function.
- Write, compile, debug, and execute C programs that correctly use system interfaces provided by UNIX (or a UNIX-like operating system).



## More Detailed Objectives

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### **Understand the Basics (week 1-2)**

- Use UNIX system calls correctly from within C programs

### **Make the OS do tasks (week 3-8)**

- Create and manage processes and threads on UNIX.
- Exploit OS semaphores and mutexes
- Control OS scheduling policy parameters.
- Take advantage of OS signals and signal handlers.
- Set OS timers and clocks.

### **Manage machine resources (week 9-12)**

- Manage files and I/O on UNIX.
- Manage memory
- Exploit DMA

### **Write networked applications (week 13-15)**

- Use communication protocols (TCP/IP) and interfaces (Sockets)
- Write distributed multi-threaded apps that talk across a network.



## Machine Problems

SMP0	Advanced C
SMP1	Programs and Processes
SMP2	Processes and Threads
SMP3	Synchronization
SMP4	Scheduling
LMP1	File Systems
LMP2	Memory Management
SMP5	Networking



## Schedule

- See class webpage

<http://www.cs.uiuc.edu/class/fa07/cs241>



## Your to-do List

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### Today:

- Visit the class webpage and check out all the info (especially schedule, grading policy, homework & MP hand-in instructions, and resources).  
<http://www.cs.uiuc.edu/class/fa07/cs241>
- Familiarize yourself with newsgroups (see <http://news.cs.uiuc.edu>) and subscribe to: **class.cs241** and **class.cs241.announce**
- Visit Compass <http://compass.uiuc.edu> and familiarize yourself with it. You will be using it to hand in homework and machine problems!
- Find a reference to refresh your C programming skills (e.g., see tutorial below)  
<http://www.lysator.liu.se/c/bwk-tutor.html>

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## Your to-do List

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### Soon:

- Sign up for a discussion section (look out for an announcement at the end of this week)
- Pair up for upcoming machine problems
- Read "[How to study](#)" Guide (see lecture notes on class webpage)

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