char\* mesg = "Welcome CS341 students!";

0. Some stuff *you* will learn

Interact with OS in C via **system** calls

Understand how OS allocates, deallocates and accesses memory

Understand **virtual memory**

Create, use, manipulate **processes** and **threads**

Understand how OS **schedules** processes and threads

Communicate and **synchronize** between threads and processes

Determine when **deadlock** **and race conditions** may occur and how to avoid them

Manipulate **filesystem** structures (inodes etc.)

Communicate across **networks**

1. Why is CS341 hard? AKA “*Look Mom no training wheels!”*

2. What’s the difference between a program image and a process?

*Overleaf, sketch the contents of the address space of a process:*Where are the Environment vars,Program Arguments,Stack,Heap, Uninitialized vars, Initialized vars, Code?

3. Things to get up to speed on before we can talk about threads or system calls in detail,

C != C++

Lifetime of variables

Arrays

Buffered I/O

Use of \* and &

C string gotchas

heap memory allocation

C library I/O (fprintf,fopen,puts,getchar…)   
uses low-level POSIX *system* *calls* (read,write,open)

4. Explain what is going on in each line and how many bytes are allocated and where.

|  |
| --- |
| 1. void test() { 2. char \* t1 = "hi"; 3. char t2[] = "ab"; 4. } |

5. Can one process create another process?

6. What is sizeof(int)?

7. What is sizeof(char)?

8. What is sizeof(char\*) ?

9. int A[8]; What is sizeof(A)?

10. How many system programmers does it take to change a lightbulb?

11. What are malloc, calloc, realloc and free?

12. A program calls printf("Hello")

when does the C library call write?

13. MPs, Lab assignments, Ed, Honors, Peer tutoring, Office Hours

14. Resources: cs341.cs.illinois.edu

15. Invited Guests & Extra Credit

Scott Fisher (Alumnus) – 2/26/2025

Rob Kooper (NCSA)