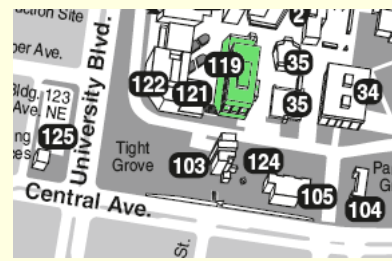


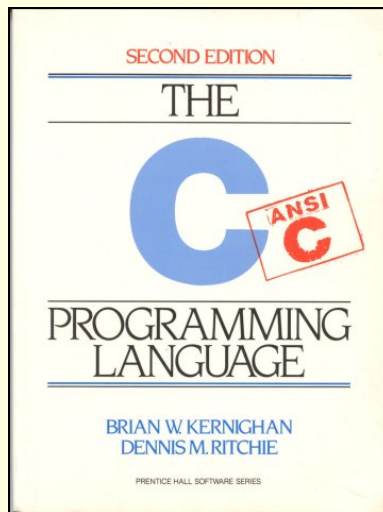
Welcome to  
**CS 241**  
Data Organization using C

Instructor: **Joel Castellanos**  
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2/8/2009

## Course Resources



Class website:

<http://cs.unm.edu/~joel/cs241/>

- Syllabus
- Projects
- Lecture Notes
- Supplemental readings

WebCT:

- Assignment Drop-box
- Assignment discussions (blogs)
- Grades

## Course Description

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- An introduction to the C Programming language for students who already have solid skills in applying basic programming techniques:
  - Loops,
  - Conditional Control Flow,
  - Variable Arrays
- Memory organization of data storage and its relation to computation and efficiency.
- Fundamental data structures such as stacks, linked lists, and trees.
- Linux command line tools.
- Makefiles.

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## Course Grading

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- 50% Programming Projects (approximately 12).
- 20% Exams (midterm and final)
- 15% laboratory programming assignments (attendance required).
- 15% Lecture quizzes (approximately 30, i-clicker, attendance required).

*Late projects/assignments will receive a 5% per day penalty.*

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## Working Together but do not Cheat

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- Working together and helping one another on all projects is highly encouraged. This includes discussion of project:
  - *specification*,
  - *algorithms*,
  - *data structures*,
  - and *test cases*.
- Do *not* share code.
- It is considered cheating to leave your code (paper or electronic copies) where others can find it. You are responsible for the security of your intellectual property.

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## Computer Access

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- Need to work on a Linux machine
- Use Putty or some other SSH to linux.unm.edu or cs.unm.edu.
- Putty is free and runs from a single executable.
- If you are planning on becoming a CS major, you can apply for a CS computer account.
- With a CS computer account you can use the CS Linux lab on the third floor of FEC.

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**James Horey: Fifth in a Row as Convocation Speaker**

James Horey will speak at the SOE convocation to be held 10:00 a.m., December 20, 2008. This marks the fifth time in a row a computer science student has been selected to be a speaker—the others were Dennis Paiz-Ramirez, Rory McGuire, Monique Morin and Aaron Clauset. James is graduating with his PhD, and his research interests include programming interfaces, runtime systems, and privacy algorithms for sensor networks. He works with [Prof. Arthur \(Barney\) MacCabe](#).

Related links: [James Horey: SoE Convocation information](#)

**Melanie Moses: Co-Author on Science Paper**

UNM CS Professor [Melanie Moses](#) was a co-author on a paper in the prestigious *Science* magazine called "[Energy Uptake and Allocation During Ontogeny](#)" (subscription required). The article was featured on UNM Today. The paper shows that the food young use to grow always stays proportional to how fast they are growing.

Related links: [Melanie Moses: Science Article](#), [UNM Today article](#)

**Kurt Ferreira Featured in Office of Advanced Scientific Computing Research**

The [Office of Advanced Scientific Computing Research](#), a Department of Energy program, published the work that CS graduate student Kurt Ferreira, his professor [Patrick Bridges](#) and Sandia team leader [Ron Chen](#) did.

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## Course Objectives

- Prepare you for CS-341 and CS-351
- Gain C programming experience.
- Put together stuff from CS-251 and CS-241 and you can program in C++ ;)
- Get you programming closer to the machine.
- See how hardware can affect how we write programs.
- Learn to debug efficiently.
- Learn to use command line Linux.

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## Why use C?

- C/C++ is used widely in industry.
- Compact language, does not change (unlike Java and C++)
- Used in many higher level courses like:
  - Networking,
  - Operating Systems,
  - Compilers,
  - Machine Language
- Often no need involve graphics (usually slows things down)

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## Data Types

Java primitive types:

1. boolean
2. char
3. byte
4. short
5. int
6. long
7. float
8. double
9. String

C corresponding types:

1. int
2. char
3. char
4. short int
5. int
6. long int
7. float
8. double
9. char\*

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## Hello World!

```
#include <stdio.h>

void main(void)
{ printf("Hello World\n");
}
```

```
gcc helloWorld.c
```

```
a.out
```

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## Coding Standards

```
#include <stdio.h>
int main()
{ int i;
  for (i=0; i<100; i++)
  { //Since xIntDiv and xFloatDiv are only used within
    //the for loop, they are declared inside the loop.
    float xIntDiv = i/2;
    float xFloatDiv = (float)i/2.0;
    if (xIntDiv == xFloatDiv)
    { printf("%d is even\n",i);
    }
    else printf("%d is odd\n",i);
  }
  return 0;
}
```

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