

# CS/ENGRD 2110

## FALL 2021

Lecture 1: Overview and intro to types

Website: [canvas.cornell.edu/courses/29519](https://canvas.cornell.edu/courses/29519)

# CS/ENGRD 2110

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- Object-oriented programming, reasoning about complex problems
- Testing; Reasoning about correctness
- Program development
- Algorithmic complexity, analyzing algorithms
- Algorithms: Searching and sorting
- Data structures: linked lists, trees, graphs, hashing
- Programming paradigms: stepwise refinement, concurrency

Undergrad Engineering: sign up for ENGRD  
All others: CS

# Welcome to CS2110!

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## OO Programming and Data Structures

Frosh	128
Sophs	227
Juniors	64
Seniors	20
Meng/MS	41
PhD	19

### Undergrads

CALS	40
Arch	5
A&S	163
BUS	21
ENG	192
HE	11

### Instructors:

David Gries

Curran Muhlberger

Recitation leaders  
(TAS): 28

Consultants: 21

~499 Total

As of late Wed, 25 August

Letter grade: 478

S/U grade: 9

AUD: 12

# Is CS2110 right for you?

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- Knowledge of Java not required

- ▣ Only ~30% of you know Java –others know Matlab, Python

- ...

- ▣ Requirement: comfort with some programming language, on the level of CS1110 (Python based) and CS1112 (Matlab based).

Prior knowledge of OO not required.

- ▣ We assume you do not know Java!

- ▣ If you know Java, the first 3 weeks will be easier for you but you STILL have to learn things, probably unlearn some things, too!

# Who is Dr. Curran Muhlberger?

- Maryland 2008:  
BS in phys, math, astro  
**Outstanding Undergrad in the college**
- Cornell 2014: PhD in physics: title  
**Numerical simulations of generally relativistic hydrodynamic systems**
- SpaceX 2014: Software Engineer.  
**“Kick Ass” award (2×) Space Exploration Technologies**
- Cornell, 2019, Lecturer! This is his fifth semester.



# Who is Dr. Muhlberger?

## A great addition to the CS Dept.

What students said about his TAing at Cornell Physics:

.. the one that everyone clearly remembers is when he explained that  $\tau$  had a similar concept to half-life in SHM. It only took about 2 minutes, and when he was done there was a resounding "Ooohhh" from everyone in the class because what the professor really confused us on was so simple when explained the way Curran explained it. ....

Bottom line ... Curran helped us both individually and as a class. And the rocket problems were always fun. ...I got really lucky to get such a good TA.

Outstanding Teaching Assistant: American Assoc of Physics Teachers

# See his websites

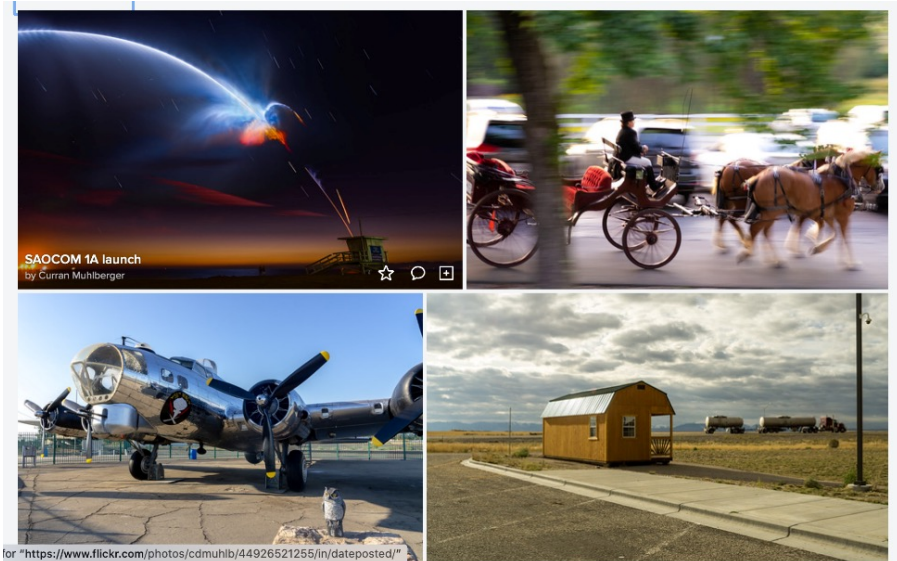
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homepage of Curran,  
physicist-turned-  
software-engineer:

<http://www.muhlbergerweb.com>

<https://www.flickr.com/photos/cdmuhlb/>

Space explorer & geek





# David Gries, Dr. rer. nat.

- MIT (Munich) 1966
- NATO Software Engineering Conference 1968
- *Compiler Construction for Digital Computers* (6 languages)
- Many more books...





## Professor David Gries

- Several Education Awards
- ACM Fellow (charter member)
- Two honorary doctorates
- Guggenheim Fellow
- Cornell Pres Weiss Fellow,  
for contriubs to Undergrad Ed
- 8 yrs as Assoc Dean of Eng
- 112th semester teaching

[www.cs.cornell.edu/gries](http://www.cs.cornell.edu/gries)



Singer, limerick-ist  
a twin and father of twins  
minister of the Universal Life Church  
(married his wife *and* his daughter)  
Sings in Ithaca Voices Multicultural  
Chorus and Ithaca's Mostly Motown

*Knew computing from the days of paper  
tape and punched cards*



# Use of Canvas website

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Let's use our canvas website to discuss:

- First-day handout
- Resources
  - CMS
  - Ed Discussion
  - JavaHyperText
- Accommodations and health
- Academic Integrity
- CS2111
- Obtaining Java and Eclipse
- **Use of course 3-week schedule**
- Assignments
- Quizzes, Exams

# Resources

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- **CMS –Course Management System .**
- **JavaHyperText.** Click link to it on Home Page OR use <http://www.cs.cornell.edu/courses/JavaAndDS/definitions.html>
- **Java resource documentation:** Click link to it on Home Page OR  
google, for example, **java 11 String** and get this webpage:  
  
[docs.oracle.com/en/java/javase/11/docs/api/java.base/java/lang/String.html](https://docs.oracle.com/en/java/javase/11/docs/api/java.base/java/lang/String.html)
- **Ed discussion:** Our discussion board. You can ask questions and help us answer questions.

# Struggling? Health issues? Personal issues?

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Get help right away.

- Talk to us: email us, visit us in office at any time  
—don't use course Ed Discussion for such
- Talk to your advisor
- Seek help from Gannett and elsewhere

Let us know as soon as you can if circumstances (will) cause you to miss part of the course.

Telling us 3 weeks after an assignment was due that you handed it in late because you were in bed with the flu is too late!

# Academic Integrity... Trust but verify!

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- 99% of you are honest and don't try to cheat
- We use artificial intelligence tools to check some assignments, so catch the other 1%
  - ▣ The software is accurate!
  - ▣ It tests your code and notices similarities between code written by different people
- Sure, you can fool this software
  - ▣ ... but it's easier to just do the assignments
  - ▣ ... and if you try to fool it and screw up, you might fail the assignment or even the whole course.

# CS2111

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- An “enrichment” course
- Help students who might feel overwhelmed by CS2110
- Gives more explanation of core ideas behind Java, programming, data structures, assignments, etc.
- Taught by Gries, Muhlberger, and a TA, 1 credit S/U
- Only for students who also take CS2110
- Only requirement: Attend weekly lecture

I would just like to thank you for taking the time to hold CS2111 this year. You have no idea how the class helped and impacted a lot of us. I would never have “survived” CS2110 without your generous share of your knowledge. I appreciated your time.

# Obtaining Java and Eclipse

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- Follow instructions on course web page
  - ▣ Make sure you have Java JDK 11, if not download and install. We explain how on the web page.
  - ▣ Then download and install the Eclipse IDE
- Test it out: launch Eclipse and click “new>Java Project”
  - ▣ This is one of a few ways Java can be used
  - ▣ When program runs, output is visible in a little console window
- It's important that you install our formatting recommendations.





# Coursework

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- 7 programming assignments (43%))
- Homeworks and recitations (7%)
- Course evaluations (1%)
- Quizzes (3%)
- Roughly biweekly quizzes (14%)
- prelim (12%)
- Final (20%)

Formula will change as course progresses and we make changes in assignments, give quizzes, etc.

# Sections (Recitations)

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Recitations start 31 Aug

Some time EARLY, visit  
StudentCenter and  
switch your section to  
even out the numbers

- Always attend
- Sometimes flipped: you watch videos beforehand, come to recitation and do something
- Sometimes review, help on homework, new material

# Assignments: a real learning experience

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- Teams of one or two
  - ▣ A0 and then A1 will be posted soon on the CMS
  - ▣ Finding a partner: Click “Finding a partner” on the home page.

One way to do  
an assignment:

Wait until the day  
before it is due.

**Result:** Frustration, anger,  
impatience, long lines in  
consulting queue. No fun.

**Not a good educational experience**



# Assignments: a real learning experience

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One way to do an assignment:  
Read the handout immediately.  
Work on it every (other) day.  
Ponder. Look things up. Get help in  
consulting, with no queue, or office  
hours. Fun, hard work, a great  
learning experience

Piano lessons:

Practice Daily?

Or put off practicing  
until an hour before  
weekly lesson?



# jshell

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We use the command-line tool **jshell** to demo and to try out small snippets of code.

Look up **jshell** in **JavaHyperText**.

Today, we use **jshell** to demo Java features concerning types.



# Homework!

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**BEFORE EACH LECTURE/RECITATION:** download slides, have them ready to look at during lectures if necessary.

**Homework 1.** Read article **Why Software is So Bad**.

Link: Course website -> Lectures notes (Lecture 1)

**Homework 2.** Get Java and Eclipse on your computer.

**Homework 3.** Do the tutorial to prepare for recitation 1.

**Homework 4.** Spend some time perusing the course website.  
Look at course information, resources, links, etc.

# Good Luck in CS2110!

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We hope you enjoy CS2110.

Work steadily, rather than procrastinate and then cram.

We're here to help. If at any you feel overwhelmed and can't complete some course work because of a personal event --illness, family issues, whatever-- contact us *immediately* not six weeks later.