

# Welcome to Programming Languages!

## Principles of Programming Languages

Colorado School of Mines

<https://lambda.mines.edu>

## Jack

(and you should call me "Jack")

### **Absolutely not my name:**

- Professor Rosenthal (Insulting to actual professors)
- Dr. Jack (I am NOT a doctor)
- Dr. Rosenthal (Who?)
- Captain Jack (I am not a pirate)
- Jack Attack (What are you? 12?)

# What is this course?

- **Programming Language Design & Implementation:**
  - What makes a good programming language?
  - What are the common trade-offs in programming language design?
  - What techniques are used to implement programming languages?
  - We're even going to implement our own programming languages!

# Why take a PL course?

- **If you're going to be a software engineer:**
  - As we work in a rapidly evolving industry, you'll be able to learn new languages quicker, and make the right choices for your next software design
  - You'll learn practical skills, such as parsing complex inputs, even if the skills aren't applied to making a programming language
- **If you're going to be a computer scientist:**
  - Thru programming languages, you will experience a very practical application of computational theory
  - We will cover the mathematical foundations of programming languages
- **If you're going to do something else:**

Quote from a student last semester

*"I didn't realize how useful PL would be until I wrote an assembler for my internship this past summer!"*

# What goes into this PL course?

## ■ Programming:

- Python (serving as a multi-paradigm OO-language)
- Racket (serving as a first step into language oriented programming)
- One language of your choice (Language Explore Project)
- *Many more*

## ■ Theory:

- Parsing
- Typing systems
- Memory management
- Lambda calculus
- Regular expressions and finite state machines
- *Much more*

# Assignments & Projects

*Homework:* You'll be given both programming and theory-related homework assignments

*Explore Project:* You'll be given the chance to study a language of your choice and submit some example programs that you wrote in this language

*SlytherLisp:* You'll implement a programming language interpreter for a Scheme-like programming language over the course of the semester



<https://piazza.com/mines/fall2018/csci400/home>

# Expectations

- **Prerequisite:** CSCI 306 (Software Engineering)
- Basic Linux skills are a *must*; CSCI 274 recommended
- All of your code is expected to run on ALAMODE (BB 136 Linux lab) machines
- Familiarity with C (or C++) will be helpful



The **Mines Linux Users Group** can help you install, setup, and learn about Linux. They have meetings open to the campus Thursdays at 6 PM.

Sign up for the mailing list for more info:  
<https://lug.mines.edu/maillinglist>

# Learning Groups

You may notice you are seated with a Learning Group:

- Please sit with them each lecture
- You will be given assignments to complete with your group outside of lecture
- We will change groups every few weeks

## Group Quiz Scores

7% of your grade will be composed of your group's quiz average (significant outliers removed). You'll be given time in class before each quiz to study with your group and help teach concepts. This portion of your grade acts as an evaluation of this teaching.

# Grading Policy

Learning Group Participation	5%
Homework	25%
Quizzes (Individual Grade)	28%
Quizzes (Learning Group Average)	7%
Language Explore Project	11%
SlytherLisp Project	24%

The course uses the plus/minus grading scale.

# Late Policy

You can turn in homework and deliverables on projects using the **slip day system**. Here's how it works:

- 1 You currently have 8 slip days.
- 2 For each 24-hours you turn in an assignment late, it will cost you one slip day.
- 3 Note the number of slip days you are spending when you turn in.
- 4 You cannot spend more than 5 slip days on a single assignment without asking for instructor permission.

# Missed Quiz Policy

- *If you cannot make a quiz:* email the instructor in advance and schedule a makeup. This does not count towards the below policy.
- *If you forget a quiz* (e.g., overslept alarm) you may contact the instructor within 24-hours of the missed quiz **once** and schedule a makeup.

(the exception to the above rule is for extenuating circumstances)

- **Beautiful Racket:** <https://beautifulracket.com/> (online, honor system payment)
- **Structure and Interpretation of Computer Programs:** <https://mitpress.mit.edu/sicp> (online, free)
- Other readings may be requested by instructor throughout the semester

Have you heard about the puzzle challenge?

Sponsored By  
**Google**

**\$300**

first place prize

**\$200**

second place prize

and more...

# CS@Mines PUZZLE CHALLENGE

Compete against your friends in solving logic puzzles

Open to all students, faculty, and staff; no coding skills needed

Compete online at

<https://puzzles.mines.edu>

BEGINS

**Sep 7**

8AM

ENDS

**Sep 10**

8AM