Exoskeleton

http://www.youtube.com/watch?v=FVveJLn6yYk

Supply Drones in use

http://www.thestar.com/news/world/2013/05/12/drones_move_one_step_closer_to_unmanned_pizza_delivery.html
Shelly

- Shelly hits the track: 120 mph
- http://www.youtube.com/watch?v=YxHcJTts2Sxk

Google Car

- http://www.youtube.com/watch?v=7Yd9lj0INX0
- This long 24 min. video is worth the time. It gets technical in the middle (the slide with the penguin) but otherwise can be followed.
Myth Busting

- Computer Science is a team sport.
- Computer Scientists are not programmers.
Programming is a team sport

Robocup:
goal is to beat humans in 2050
Natural Computing

Computation inspired by nature.
To develop novel problem-solving techniques.

Charles Darwin

Evolutionary Computing

Initialisation  
Evaluation  
Parents  
Stop?  
Selection  
Genitors  
Crossover, Mutation,...

Best individual  
Replacement  
Generation  
Evaluation  
Offspring
Robot evolves walking

Generation 0

- Lohn, Hornby, and Linden
Robotic Dragonfly

http://www.youtube.com/watch?v=nj1yhz5io20

Berkely Bionics

http://www.youtube.com/watch?v=WcM0ruq28dc

Human Universal Load Carrier
http://www.youtube.com/watch?v=bVS8C8QUh1A

HULC in 2012
http://www.youtube.com/watch?v=KU95h6YCUuM
Big Dog

http://www.youtube.com/watch?v=W68VVn-d5uA

Tossing Blocks
http://www.youtube.com/watch?v=2jvLalY6ubc

What to cover today

- Who am I
- Who are you (10-80-10 rule)
- Why are we here
- How hard is this (can I do this, why is this so hard)
- What can I expect (cheating, group work, experiments, start early, ask questions)
- Syllabus
- Hey, we’re doing Python now!
- Computer Stuff
Dr. Enbody

231 FS 13 Majors

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10-80-10 rule
60% of 4.0 grades answered “never programmed before CSE231”

80% of 3.0 grades answered “at least some programming before CSE231”

Spring 2005 1st day Survey

Problem solving using a computer.
Programming is hard.

You have two related problems:
- Learn Python
- Learn problem solving.

You have to solve both at the same time.
Problem Solving: we’d like to embed our own thoughts in computers.

Incredibly difficult.

Computer Science & Problem Solving

Learning the difficult process of “laying out” a problem-solving task
Providing tools to make it as easy as possible.
About the Course

- Previous programming experience is not expected. Most students have never written a program.
- Calculus is a prerequisite (remember, rigor in problem-solving)
- Familiarity with a computer is useful.

Material

Course material is available on the Web at http://www.cse.msu.edu/~cse231

Discussion forums on Piazza: https://piazza.com/

MyProgrammingLab: http://www.myprogramminglab.com/

Desire2Learn
Text

The Practice of Computing Using Python, 2nd edition

Python 3

By Punch and Enbody

Addison-Wesley, 2012

ISBN-10: 013280557X

On reserve in Engineering Library.
Also: coursesmart.com

Labs

- There are required, twice-weekly laboratory exercises.
- In order to pass the course, a student can miss at most 2.
- Grading on labs is credit/no_credit. Habitually late receive no_credit.
- Collaboration on labs is required.
Computer Projects

- There will be 11 computer projects and one written assignment (Haiku) that form 45% of the course grade.
- **Late computer projects are not accepted.**

Collaboration on Projects

- Under no circumstances should individuals share their project code with another student.
- If you share your project code with another student, you can count on getting a zero: experience shows that a student who "simply wants to look at your project code" will either copy parts of it or pass it on to another student who copies it.
- Protect yourself, students steal scrap outputs, temp files on the computer, etc.
Collaboration

We encourage collaboration for

- Labs
- MyProgrammingLab
- In-class exercises
- Project design,
  that is, work with others to design the project up to the point of coding Python. After that, collaboration is forbidden.

Analogy

Plagiarism rules in writing classes:

- copying lines of code is similar to copying sentences;
- copying blocks of code is similar to copying paragraphs;
- copying a whole project is similar to copying a whole paper.

None of the above is acceptable.
MOSS (Measure Of Software Similarity)

You will do in-class “exercises” to emphasize the points being made.
MyProgrammingLab

Short exercises to reinforce learning.

Examinations

- Two midterms and a final exam constitute 45% of the course grade. Exam dates are in the syllabus.
- Sample exams are on-line.
  - They are multiple choice.
  - Bring a picture ID and pencil.
  - Bring one page of notes (8.5x11 both sides)
  - No electronic devices (paper dictionary OK)
Grades

- 45%: Computer Projects
- 45%: Exams
- 10%: Exercises (in-class + MyProgrammingLab)
- To receive a non-zero grade a student needs to do ALL the following:
  - miss no more than 2 labs
  - at least 50% of computer project points
  - at least 50% of exam points

Exam score breakdown

- Midterm Exam: 100 pts
  (10% overall)
- Midterm Exam: 150 pts
  (15% overall)
- Final: 200 pts
  (20% overall)
Grading Scale

4.0  900 - 1000 points  
3.5  850 - 899 points  
3.0  800 - 849 points  
2.5  750 - 799 points  
2.0  700 - 749 points  
1.5  650 - 699 points  
1.0  600 - 649 points  
0.0   0 - 599 points

Adjustments, or “The Curve”

Past Heuristic:
Median Exams + Perfect Projects + All Exercises  
≈ 3.0/3.5
Labs, attendance is important!!

Students who miss more than two labs will have their final grade reduced by 0.5 for each lab missed.

Calendar

The course calendar indicates topics and readings for the whole semester.
On-Campus Computing

- All students taking CSE courses get an account on CSE computers which they can access remotely or in the CSE labs on the third floor of Engineering.
- The CSE computing labs are open 7x24 and your account is active on all the machines in all the labs.
- Login name is the same as MSU, but the password is different. Set during lab.

On-Campus Help Room

- A CSE 231 help room is provided. Help room hours are posted.
- The help room is overcrowded the day projects are due so do not expect extensive help at the last minute. There are many of you and only one TA.
Also,

Tutoring is available
- in Wilson Hall (provided by Engineering)
- at MSU Learning Resource Center

Piazza forums

- Piazza has forums for discussion about various topics
- TA monitors it
- You may help others, but don’t post code
Tips

1. Think before you code.
2. Be a scientist: experiment.
4. Use (start with) examples.
5. Use Python interactive shell.

Why Python?

1. Simpler (than C++, Java, etc.)
2. Interactive
3. User Base
4. Useful
Course Goal:
“Hey, I’ll just write a program for that”

What about other CS courses?
- C++
- Python helps.
CSE 232 Experiment

- SS08 232 had a mix of Python and C++ students from 231
- Gave **exactly** the same final from SS07 where everyone took 231 in C++. Thus same topics covered.
- Absolutely no difference in performance from the 231-Python vs 231-C++ students, or from SS08 vs SS07 students
- Python doesn’t affect 232-C++ performance!

Show majors.py

(also show CSE231.csv)
Questions?