CSc 520

Principles of Programming Languages

0 : Administrivia

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Contact Information

Class	:	520 PRINCIPLES OF PROGRAMMING LANGUAGES
Lecturer	:	Christian Collberg
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Office	:	758
Office Hours	:	Open door policy
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Lectures	:	15:00–16:15, MW, GLD-S 701
Book	:	Programming Language Pragmatics. Michael Scott
TA	:	TBA

Course Outline (Subject to change)

- This course will define, analyze and evaluate important concepts found in current programming languages.
- Its goals are to build an ability to evaluate and compare programming languages.
- We will evaluate and compare languages both from the user's and implementor's view.
- We will develop precise mechanisms for specifying the semantics of programming languages.

Course Outline (Subject to change)...

In particular, we will cover the following topics:

1. scope of objects and time of binding
2. module mechanisms (e.g., blocks, procedures, coroutines)
3. data abstraction, datatypes
4. control structures
5. storage management and runtime support
6. operational, denotational, and axiomatic semantic specification; attribute grammars
7. applicative and object-oriented languages

Grading (Subject to change)

1. One final exam (50%) .
   (a) The exam is closed book.
   (b) Without prior arrangement, missed exam ⇒ grade of zero.
   (c) Fail the exam ⇒ you will fail the course.
2. "Several" homework assignments (50%) . Homeworks may require programming, theoretical work, or paper presentations.

Prerequisites, Required Knowledge

- Prerequisites: C Sc 453, or equivalent background in Compilers.
- You need to be a competent programmer in a procedural/object-oriented language, such as Java or C.

Syllabus

You are responsible for reading
and understanding this syllabus.
If you have any concerns or issues
about the information in this document
you should bring them up during the
first week of class.

Required extracurricular activities

- Programming assignments.
- Homework assignments.
- Reading the textbook.
- Working programming exercises on your own.

Special materials required for the class

- None.

Assignment Format

- Assignments will be mostly in the form of programming problems.
- You may work the assignments on any machine you want, but before you hand them in you should test the code on lectura! I will grade the assignments on lectura, and if they don't work there, I won't debug them for you!
- There can be subtle problems with code that's developed on a Windows machine, for example, when it is run on a Unix machine. For example, the two systems use different newline characters.

Assessment Scheme

Tests, Quizzes, and Assignments

There will be

1. one comprehensive final exam, worth a total of 50%;
2. assignments, worth a total of 50%.

Late Assignments

- Assignments handed in no more than 24 hours late will incur a 10% penalty.
- Assignments handed in more than 24 but no more than 48 hours late will incur a 20% penalty.
- Assignments handed more than 48 hours after the deadline will receive a grade of 0.

Making up Tests

You cannot make up the midterm or final exam unless

1. you have notified the instructor in writing (email is fine) or by phone prior to the test that you will be absent, and
2. you receive permission from the instructor to take the test at a later date.

Curving

- All grades (for exams, quizzes, and assignments) will be curved up by throwing away the highest grade in the class and scaling up such that the second highest grade is 100.
- The curving is done to adjust for particularly difficult tests/assignments, and to prevent an outlier from skewing the grade distribution.
- You cannot, after scaling, receive more than 100 on any exam, quiz, or assignment.

Grade Assignment

- You will fail the class if you get less than 50 (after curving) on the final exam.
- Otherwise, a curved total grade of [90,100] gives you an A, [80,89] a B, [70,79] a C, [60,69] a D, and 59 and below an E.

Incomplete work policy

- Except under exceptional circumstances I will not assign incomplete grades.
- I decide what is an exceptional circumstance.

Detailed Grading Scheme

- To avoid any ambiguities, I have formalized the informal rules given above.
- The rules below should be considered *minimum* requirements to achieve a particular grade. The instructor reserves the right to do additional adjustments, as necessary.
- Any contradictions, omissions, errors, or ambiguities in the grading scheme will be resolved by the instructor.
- Any issues or concerns regarding the grading scheme should be brought to the attention of the instructor within the first week of class.

Details — Curving

- All raw scores range from 0 to 100.
- Each individual score (final, midterm, quizzes, assignments) will be curved using the function

  $$\mathrm{curve}(x, s) = \min(100, (100.0/\max(x - \max(x)))x_s)$$

  where x is a set of scores (for an assignment, a test, etc.) and s is a student.
- Note: $-$ is set subtraction.
- $\mathrm{curve}(x, s)$ returns s's score, curved up by $100.0/\mathit{2nd\_highest\_class\_score}$.

Details — Curving. . .

- For example, assume the following final exam scores:

  $$34 \quad 45 \quad 66 \quad 88 \quad 98$$

  After the curve has been applied, the scores will be

  $$38.6 \quad 51.1 \quad 75 \quad 100 \quad 100$$

Details — Exams

final exam:

- Let f be the set of final exam scores.
- Let f^s be the final exam score for student s.
- Let $\mathcal{W}^f$ be the weight of the final exam (50%).
- $t_f^s = \text{curve}(f, s)\mathcal{W}^f$ is the curved final score for s.

Details — Assignments

- Let a_i be the set of scores for the i:th assignment.
- Let a_i^s be the score for student s on the i:th assignment.
- Let $\mathcal{W}_i^a$ be the weight of the i:th assignment ($\sum_i \mathcal{W}_i^a = 50\%$).
- Let α_i^s be the assignment score after late penalties have been applied:

$$\alpha_i^s = \begin{cases} a_i^s & \text{if the assignment is handed in on time} \\ 0.9a_i^s & \text{if the assignment is} > 0 \text{ and} \leq 24 \text{ hours late} \\ 0.8a_i^s & \text{if the assignment is} > 24 \text{ and} \leq 48 \text{ hours late} \\ 0 & \text{if the assignment is} > 48 \text{ hours late} \end{cases}$$

Details — Assignments. . .

- $t_a^s = \sum_i (\text{curve}(\alpha_i, s)\mathcal{W}_i^a)$ is the total curved assignment score for student s.
- If, for whatever reason, the actual number of assignments is less than the planned number, the $\mathcal{W}_i^a$'s will be scaled up uniformly.

Details — Total Scores

- The raw total score for student s is

$$t_s = t_f^s + t_a^s$$

- We round up to the nearest integer:

$$\text{total}_s = \lceil t_s \rceil$$

Details — Grade Assignment

- The final grade assignment for student s is

$$\text{grade}_s = \begin{cases} E & \text{if } t_f^s < 50 \\ \begin{cases} A & \text{if } \text{total}_s \in [90, 100] \\ B & \text{if } \text{total}_s \in [80, 89] \\ C & \text{if } \text{total}_s \in [70, 79] \\ D & \text{if } \text{total}_s \in [60, 69] \\ E & \text{if } \text{total}_s < 60 \end{cases} & \text{otherwise} \end{cases}$$

- In other words, a student with a curved final exam score $t_f^s < 50$ will fail the class, regardless of their results on the other assessment categories.

Policies

Office hours

- I use an open door policy:

Collberg's Café

- Please come and see me to chat, ask questions, or snack:

Attendance Policy

- My goal is to keep class attendance high so that we can get good discussions going in the class.
- You are not required to attend lectures, but. . .

  you cut class at your own risk.

  Anything covered in class or in any of the required readings is fair game on tests and exams.

Attendance Policy. . .

- All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion. Absences pre-approved by the UA Dean of Students (or Dean's designee) will be honored.

Subject to Change Policy

- The information contained in this course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.
- The instructor reserves the right to
  1. add, drop, or change topics;
  2. change exam or homework dates, etc.
- Changes will be announced in class and on the class web site!
  You are responsible for checking this site regularly.

Notification of Objectionable Materials

- There is no objectionable material in this class.

Computer Access/Setup

You will be completing your homework on the department's instructional machine, Lectura. You will also have access to the department's lab in Gould-Simpson 228. You can access Lectura over the network or by dialing in. You will, therefore, need to set up an account on Lectura. To do so, go to the seventh floor of Gould-Simpson during normal business hours during the first few days of the semester and follow the instructions for setting up an account. When you apply for your account, you will pick up an application form. Fill out and return the form to Gould-Simpson 721 to pick up a magnetic access card that will allow you 24-hour access to the Gould-Simpson 228 lab.

Handicapped Accessibility

Students with disabilities who require reasonable accommodations to fully participate in course activities or meet course requirements must register with the Disability Resource Center. If you qualify for services through DRC, bring your letter of accommodations to me as soon as possible. See `http://www.salt.arizona.edu/`.

Student Code of Academic Integrity

- Assignments in this course require individual attention and effort to be of any benefit. All work is expected to be that of each student alone. You may not consult with others, except in ways specifically authorized by the course instructor. You also may not plagiarize another person's work or copy another person's code.

Student Code of Academic Integrity…

- Students are responsible for understanding and complying with the University's Code of Academic Integrity. A synopsis of the Code is attached; the full text is available from the Office of the Dean of Students in Room 203 Old Main. Among other provisions, the Code demands that the work you submit is your own, and that graded papers and exams will not subsequently be tampered with. Copying of another student's programs or data, or writings is prohibited when they are part of a published class assignment; it is immaterial whether the copying is by computer, xerox, pen or other means. Witting collaboration in allowing such copying is also a Code violation.

Student Code of Academic Integrity…

- Assignments in this course require individual attention and effort
- Violations of the Code will, at minimum, result in loss of credit for a graded item. An egregious first violation or any second violation will minimally result in failure of the entire course.
- See also `http://studpubs.web.arizona.edu/policies/cacaint.htm` the University of Arizona Code of Academic Integrity.

I take academic integrity seriously! I will report *every* violation!

Expected classroom behavior

- Be courteous and treat others in the class with respect.
- Please be courteous to other students by refraining from talking, playing loud music in your headphones, silencing cell phones, pagers, etc.
- We come to class to learn: don't read the newspaper, solve cross-word puzzles, etc.

Policies against threatening behavior

- Read and abide by the following link:
  `http://policy.web.arizona.edu/~policy/threaten.shtml`.

Now What?

Let's Have Fun!!![a]

[a] That's right — learning about programming languages is fun!