CS 381, Programming Language Fundamentals, is a four-credit course for undergraduate students. The course introduces concepts found in a variety of programming languages and exposes students to non-imperative programming paradigms. Topics to be covered include: Haskell, Prolog, syntax, scoping, parameter passing, types, polymorphism, exception handling, and semantics.

Instructor:
Keeley Abbott
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Office: KEC Atrium
Lectures: M–Th 16:00–16:50
Office hours: M 11:30–12:30 & Tu 13:00–14:00 & Th 15:00–16:00

Students with Disabilities:
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737.4098.

Learning Objectives:
At the end of the course, students should be able to perform the following tasks.

1. **Define abstract syntax** for a language that is given in concrete syntax.
2. **Produce and explain** a program’s output under static versus dynamic scoping mechanisms.
3. **Produce and explain** a program’s behavior under static versus dynamic typing mechanisms.
4. **Produce and explain** a program’s output under a selection of parameter passing mechanisms, such as by-value, by-reference, by-constant, by-result, by-value-result, and by-name.
5. **Produce and explain** the contents of the runtime stack at any moment in a program’s execution.
6. **Produce** programs exhibiting the following kinds of polymorphism: parametric polymorphism, overloading, and subtype polymorphism, and explain their advantages and disadvantages.
7. **Explain** exception handling mechanisms and demonstrate the effects of exceptions on the runtime stack.
8. **Explain** the essential differences between the imperative, object-oriented, functional, and logic programming language paradigms.
9. **Define** the semantics of simple languages or for individual language constructs using axiomatic, operational, or denotational semantics, and given such definitions, predict specific program values or relationships between values using the definitions.
Tentative Schedule (subject to change):

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<tr>
<th>Week</th>
<th>Topic</th>
<th>Objective</th>
<th>Monday</th>
<th>Tuesday</th>
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<td>Introduction, Haskell</td>
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<td>2</td>
<td>Abstract Syntax</td>
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<td>Quiz</td>
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<td>Semantics</td>
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<td>Quiz</td>
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<td>3, 6</td>
<td>Holiday</td>
<td>Quiz</td>
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<td>5</td>
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<td>5, 3</td>
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<td>Midterm</td>
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<td>6</td>
<td>Parameter Passing, Exceptions</td>
<td>4, 7</td>
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<td>7</td>
<td>Programming Paradigms, Prolog</td>
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<tr>
<td>8</td>
<td>Prolog, Review</td>
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<td>Final</td>
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For the latest scheduling information, check the course web page regularly!

There is no specified finals schedule for Summer term – the final will be held during the last class meeting of the term.

Textbook:

There is no assigned textbook for this course. However, there are several online resources available (and listed on the course website) which you may find useful.

Grading:

- 20% Quizzes
- 20% Homework
- 25% Midterm exam
- 35% Final exam

Course Policies:

All quizzes and exams are closed book and closed notes. Quizzes will be held on Mondays, and exams will be held on Thursdays.

Teamwork on homework is encouraged. Teams of two or three students may submit a common homework as long as all members are clearly identified on the submission. All students in a team must contribute to the team solution and will receive the same grade. *Adding the name of a student who has not contributed to a solution will be regarded as cheating, and will be handled accordingly.* All team members must be able to explain their homework contribution to the instructor.

Homework assignments are submitted through TEACH as well as a printed copy submitted in class. Log in and click “Submit Assignment” in the navigation bar on the right, located under “Class Tools.” You should see a list of currently open submissions.

Note that due to logistical issues late homework assignments will not be accepted. Please be sure to submit your assignments on time.

This syllabus and other information can be found on the course web page:

[http://web.engr.oregonstate.edu/~abbottk/teaching/cs381-su16/](http://web.engr.oregonstate.edu/~abbottk/teaching/cs381-su16/)