CPSC 425A: Principles of Programming Languages  
Spring 2010

Instructor: Dr. Durell Bouchard  
Office Hours: MW: 4:00-5:00, TTH: 1:00-2:30, Also by appointment or open door  
Office: Trexler 365-C  
E-Mail: bouchard  
Phone: 375-4901

Course Objectives

This course takes an intensive, hands-on approach to the design and implementation of programming languages. Instead of hearing descriptions of various language features and their manifestation in a laundry list of programming languages, you will use the language Scheme to experience and implement the essential elements of programming languages. These "essentials" include inductive data specification and recursive programming, formal descriptions of syntax and semantics, variable scope, data abstraction, lambda calculus, imperative constructs, first-class procedures, parameter passing, and, tying it all together, language interpretation. If time permits we will also touch on object-oriented programming in this context.

Intended Learning Outcomes: At the end of the course the successful student will be able to

1. design and develop algorithms to solve problems in the Scheme programming language.  
2. implement or extend a programming language and an interpreter for the language.  
3. explain the fundamental concepts underlying different programming paradigms.  
4. analyze and compare the strengths and uses of various programming languages.

Course Content

Prerequisite: CPSC 270  


Assignments: In addition to regular reading, there will be frequent assignments during the semester. These assignments are designed to give the student the opportunity to put into practice the problem solving and programming skills they have learned. As such they are one of the most important aspects of the course both for student learning and for assessment. The assignments, most of which involve writing programs, will vary in length and difficulty. Students are encouraged to work together on homework assignments, but each of you must turn in your own set of solutions along with a list of the people you worked with.

Project: Each student will research and report on an interesting programming language that he or she did not already know. The report will consist of a short paper and an oral presentation.

Tests and Exams: Two tests and one comprehensive final exam will be given.

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<tr>
<th>Test Dates</th>
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<tr>
<td>Test #1</td>
<td>Monday, February 15</td>
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<td>Test #2</td>
<td>Monday, March 22</td>
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<td>Final Exam</td>
<td>Monday, April 26 (2:00PM-5:00PM)</td>
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MCSP Conversations: The Department of Mathematics, Computer Science, and Physics (MCSP) is offering a series of discussions that appeal to a broad range of interests related to these fields of study. These co-curricular sessions will engage the community to think about ongoing research, novel applications, and other issues that face our disciplines. You are invited to attend all of these events but participation in at least 3 is mandatory. Within one week of attending an event you must submit a one-page paper reflecting on (not just summarizing) the discussion. If you do not turn the paper in within the one week time frame you may not count that event as one you attended. The MCSP discussions are generally scheduled for Wednesdays at 5:30 or Tuesday or Thursday at 7:00. A schedule will be provided soon and will be posted on the course web page. Please discuss scheduling conflicts with the instructor ASAP.

Grading: Course grades are assigned based on the following weights and scale:

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<tr>
<th>Grade</th>
<th>Assignments</th>
<th>Tests</th>
<th>Final Exam</th>
<th>Co-curricular</th>
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<tr>
<td>Scale</td>
<td>93-100</td>
<td>83-86</td>
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<td>90-92</td>
<td>80-82</td>
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<td>87-89</td>
<td>77-79</td>
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<td>below 60</td>
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<td>B+</td>
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Course Policies

Academic Integrity: It is accepted that you have read and understood the standards for academic integrity at Roanoke College. All tests, exams, and assignments are to be the work of the individual student. You are encouraged to get help from the instructor if you need help with any aspect of the course including programs and assignments. Student assistants, tutors, and classmates may help you understand course concepts but may not show you how to do any particular aspect of an assignment. Students may discuss lab work (including the pre-lab assignments) and help each other out but in all cases the work you turn in must be your own. Copying someone else’s work or turning in someone else’s work is NEVER allowed. Using someone else’s work or ideas as your own is plagiarism and an academic integrity offense. Examples of academic integrity violations include copying a program or part of a program (even one line) from someone else, writing code for someone else, telling someone else how to solve a problem or having someone tell you how to solve a problem. Discussion among students about programming projects should be limited to general concepts, not specific aspects of how to complete the work.

Computer Use Policies: All students must abide by the Computer Use policies of Roanoke College. Failure to do so will result in involuntary withdrawal from the course.

Attendance Policy: Class attendance is vital to your success in this course; material covered during missed sessions is the responsibility of the student. Conversations held in class illuminate the published class materials and are subject to evaluation on subsequent tests.

Late Assignments: Unless otherwise specified, assignments are to be turned in before the start of class on the due date. Late assignments will not be accepted. If you anticipate being unable to meet a deadline, talk to me at least 24 hours before the deadline. In extenuating circumstances we may be able to make special arrangements. Please note that this must be discussed — just sending an email does not automatically grant you extra time. Electronic "glitches" do not waive your responsibility to submit your work in a timely manner.

Make-up Policy: Everyone is expected to take tests and the exam at the scheduled time. Make-ups will be given only for legitimate, documented absences that the instructor has been notified of ahead of time. Make-up tests, if given, may be oral.

Electronic Devices: All cell phones and pagers must be turned off prior to entering the classroom or
lab. The use of any electronic device during a test is prohibited. This includes cell phones, Palm Pilots, Blackberrys, Pocket PCs, and laptops. Any use of such a device during a test will be considered a breach of academic integrity.

**Special Services:** If you are on record with the College's Special Services as having special academic or physical needs requiring accommodations, please meet with me during my regular office hours or schedule an appointment as soon as possible. We need to discuss your accommodations before they can be implemented. Also, please note that arrangements for extended time on exams and testing in a semi-private setting must be made at least one week before every test or exam. If you believe you are eligible for accommodations but have not yet formally contacted Special Services, please call 375-2248 or drop by the Center for Learning and Teaching in Fintel Library.