General Information

Instructor: Matthew Fluet
E-mail: mtf@cs.rit.edu
Office hours: Tue. 9:00am – 11:00am; GOL-3555
Wed. 9:00am – 11:00am; GOL-3555
or by appointment

Lectures: Section 01 MW 12:00pm – 1:50pm; GOL-3550

Website: http://www.cs.rit.edu/~mtf/teaching/20122/cc
http://mycourses.rit.edu

FusionForge Server: https://asgard.cs.rit.edu:443

Course Description

This course discusses design and implementation of language processors and translators. Topics include lexical, syntactic, and semantic descriptions, algorithms for analysis tools, and programming techniques, as well as environment-, stack-, and heap-based interpreters and code generation for typical computer architectures.

Prerequisites

- 4003-700 (Foundations of Computer Theory) and 4003-707 (Advanced Programming) and 4003-709 (Programming Language Concepts)
- or permission of instructor
Text Books

Strongly recommended:
Title: Modern Compiler Implementation in ML
Author: Andrew Appel
Publisher: Cambridge University Press
ISBN: 978-0521607643

Title: Compilers: Principles, Techniques, & Tools (Second Edition)
Author: Alfred Aho, Monica Lam, Ravi Sethi, Jeffrey Ullman
Publisher: Prentice Hall
ISBN: 978-0321486813

Recommended:
Title: ML for the Working Programmer
Author: Lawrence Paulson
Publisher: Cambridge University Press
ISBN: 978-0521565431

Optional:
Title: Elements of ML Programming
Author: Jeffrey Ullman
Publisher: Prentice Hall
ISBN: 978-0137903870

Title: The Standard ML Basis Library
Editors: Emden Gasner and John Reppy
Publisher: Cambridge University Press
ISBN: 978-0521794787

Grades, Exams, and Assignments

Grades will be assigned based on the following grading scheme:

- **Attendance & Participation**: 5.0%
- **Homework Assignments**: 10.0%
- **Programming Projects**: 55.0%
- **Mid-term Exam**: 15.0%
- **Final Exam**: 15.0%

Attendance & Participation

Students are required to attend and expected to participate in class. Participation means being an engaged student: asking and answering questions, not simply attending class.

The use of cell phones and audio players is prohibited during class. If you must take a phone call, please leave the classroom immediately and do not return until you have ended the phone call.
The use of a laptop (or notebook or netbook) computer is permitted during class only for the purpose of taking notes. Persistent use of a laptop for other activities will result in 0 credit for your Attendance & Participation grade.

Course Project

The project for the course is to implement a small functional programming language, called LangF. (Students who have taken 4005-710 should recognize the language as an enrichment of System F, the polymorphic $\lambda$-calculus.) The project will be divided into five parts, each requiring a significant programming effort. The implementation will be undertaken using the Standard ML programming language and submission of the project milestones will be managed using the course FusionForge server. Programming projects will be individual efforts (no group submissions).

Mid-term Exam

There will be one mid-term exam; see below for date.

The mid-term exam must be taken at its scheduled time. Make-up mid-term exams will not be administered, unless exceptional circumstances have been discussed with the instructor in advance of the exam date and/or other arrangements have been made.

Final Exam

There will be a final exam; see below for the date. The final will be comprehensive and will cover material from the entire course, including readings, lectures, and assignments.

The final exam must be taken at its scheduled time. Any exam conflicts must be reported to the instructor by the end of Week 6 (see the RIT Final Examination Policies).

Late Policy

Assignments that are submitted electronically (most assignments) will generally be due at 11:59PM on the due date. Assignments that are submitted in person will generally be due at the beginning of a class period.

Assignments are to be submitted on time. However, to accomodate the occasional difficulty with meeting an assignment due date, each student begins the term with five “extension tokens.” By spending an extension token, you will receive a 24-hour extension on a single assignment. To spend an extension token, you must e-mail the instructor before the assignment is due; you cannot spend an extension token after an assignment’s due date has passed. You may spend at most two extension tokens on a single assignment (and you may spend the second extension token at any time before the first extension expires). After spending five extension tokens, late assignments will not be accepted.
Regrading

After a graded exam or assignment has been returned, you have **one week** to bring any questions about grading to the instructor’s attention. No grade adjustments will be made after this time.

### Important Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tr>
<td>December 12 (Wed.)</td>
<td>First project milestone (scanner)</td>
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<tr>
<td>January 09 (Wed.)</td>
<td>Mid-term Exam (in class, 110min)</td>
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<tr>
<td>January 11 (Fri.)</td>
<td>Second project milestone (parser)</td>
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<td>January 28 (Mon.)</td>
<td>Third project milestone (type checker)</td>
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<tr>
<td>February 04 (Mon.)</td>
<td>Fourth project milestone (interpreter)</td>
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<tr>
<td>February 15 (Fri.)</td>
<td>Fifth project milestone (code generator)</td>
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<tr>
<td>February 22 (Fri.)</td>
<td>Final Exam (10:15am – 12:15pm; GOL(70)-3520; Section 01)</td>
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### Academic Integrity

As with all courses, the [RIT Honor Code](#) and the [RIT Academic Honesty Policy](#) apply. See the Department of Computer Science’s statement on [academic integrity](#) for more details.  

In this course, all submitted work must be your own work (i.e., written or programmed by you alone, unless explicitly stated otherwise) and must include acknowledgments of any collaborators or sources (other than course text books or handouts) used to produce your submission.

You are encouraged to discuss course material with other students. Discussion of assignments is also allowed, but sharing solutions or code is not allowed.

### Disclaimer

I reserve the right to make any changes to the syllabus as I deem necessary throughout the course. Minor changes, such as assignment due dates, will be announced orally during class and posted on the course mailing list and home page. Major changes, such as grading percentages, will additionally be provided in writing.