

CSCI-3136 — Principles of Programming Languages

Course Syllabus: Summer 2017

1 Instructor Information

Instructor:	Dr. Tami Meredith	Office:	TBA
E-mail:	tami.meredith@live.com	Office Hours:	M/W 12:05-13:25
Class Meeting Time:	MW 10:35-11:55	Room No:	CS-127
Course Homepage:	http://www.tamimeredith.ca/academic/csci-3136		

2 Important Dates

1. Midterm Exam: Monday, June 19, 2017, in class
2. Final Exam: TBA (Early August)
3. Final Withdrawal Date without academic penalty: May 29, 2017
4. Final Withdrawal Date with academic penalty: June 26, 2017
5. Deadlines: 8 assignments; Due at 10:35 on May 24, & 31; June 7, 14, & 28; July 5, 12, & 19;

3 Course Objectives and Learning Outcomes

This course provides a comparative study of advanced programming language features. Topics include statement types, data types, variable binding and parameter passing mechanisms. Formal methods for syntactic and semantic description of programming languages are examined.

4 Evaluation Criteria

1. Assignments (40%)
 - Eight (8) assignments.
 - Assignments will be done in groups of three (or fewer).
 - Written assignments must be submitted in paper at the start of the class.
 - Programming assignments must be submitted electronically.
 - **Late assignments will not be accepted.**
2. Midterm Exam (20% or 0%)
 - If, for some reason, you do not write the midterm then your midterm will be worth 0% and your final will be worth 60%.
3. Final Exam (40% or 60%)

Note: The instructor reserves the right to adjust a student's evaluation criteria, with the student's consent, if the instructor deems that an adjustment is warranted.

5 Midterm and Final Exam Requirements

- Photo ID is required.
- Closed book.
- No dictionaries, notes, calculators, cell phones, PDAs, talking slide rulers, secret decoder rings, or other electronic aids allowed.

6 Required Texts and Resources

The text for the course is: *Scott M., "Programming Languages Pragmatics, 4th ed.", Morgan Kaufmann, 2015, ISBN: 0124104096.*

Course announcements will be posted to the course web site and emailed to the students via Brightspace. It is the student's responsibility to check their Dal e-mail account on a regular basis. If you do not know how to access your Dal e-mail account please see <http://www.dal.ca/dept/its/o365/services/email.html>

7 Prerequisites

CSCI 2110.03, CSCI 2112.03, and CSCI 2132.03

8 Tentative List of Topics to be Covered

1. Overview
 - Overview of Programming Languages
 - Introduction to Program Translation
2. Lexical Analysis
 - Scanners and Formal Languages
 - Regular Languages and Regular Expressions
 - DFSAs and NFSAs
 - Equivalence between FSA / RE / RL
 - NFSA and DFSA Transformations
 - Properties of Regular Languages
 - The Pumping Lemma
3. Parsing
 - Parsing and Grammars and CFGs
 - Parse Trees, Ambiguity, and Derivations
 - Constructing an LL(1) Parser
 - Recursive Descent Parsing
 - PDAs, DPDAs, and Parsing with a DPDA
4. Semantic Analysis
 - Semantic Analysis
 - Attribute Grammars
 - S-Grammars and L-Grammars
5. Naming and Binding
 - Nameing, Binding, and Storage
 - Scope
 - Closures
 - Modules
6. Flow Control
 - Expressions and Statements
 - Sequencing and Selection
 - Iteration
 - Recursion
7. Computation Abstraction
 - Subroutines, Functions, Parameters
 - Exception Handling
 - Continuations
8. Type Systems and Memory Management
 - Type Systems
 - Arrays Implementation
 - Garbage Collection
9. Functional Languages
 - Introduction to Haskell
 - Functions and Currying
 - Lazy Evaluation and Other Features
10. Object Oriented Languages
 - Languages and Inheritance
 - Encapsulation and Overloading
 - Binding and Implementation

9 Academic Integrity¹

At Dalhousie University, we respect the values of academic integrity: honesty, trust, fairness, responsibility and respect. As a student, adherence to the values of academic integrity and related policies is a requirement of being part of the academic community at Dalhousie University.

What does academic integrity mean?

Academic integrity means being honest in the fulfillment of your academic responsibilities thus establishing mutual trust. Fairness is essential to the interactions of the academic community and is achieved through respect for the opinions and ideas of others. Violations of intellectual honesty are offensive to the entire academic community, not just to the individual faculty member and students in whose class an offence occurs. (see Intellectual Honesty section of University Calendar)

How can you achieve academic integrity?

- Make sure you understand Dalhousie's policies on academic integrity.
- Give appropriate credit to the sources used in your assignment such as written or oral work, computer codes/programs, artistic or architectural works, scientific projects, performances, web page designs, graphical representations, diagrams, videos, and images. Adequately cite and reference appropriately any work that is not fully your own. You may, optionally, use RefWorks to keep track of your research and edit and format bibliographies in the citation style required by the instructor (<http://www.library.dal.ca/How/RefWorks>)
- Do not download the work of another from the Internet and submit it as your own.
- Do not submit work that has been completed through collaboration (outside of your group) or work that you previously submitted for another assignment without permission from your instructor.
- Do not write an examination or test for someone else.

These examples should be considered only as a guide and not an exhaustive list.

What will happen if an allegation of an academic offence is made against you?

I am required to report a suspected offence. The full process is outlined in the Discipline flow chart, which can be found at: <http://academicintegrity.dal.ca/Files/AcademicDisciplineProcess.pdf> and includes the following:

1. Each Faculty has an Academic Integrity Officer (AIO) who receives allegations from instructors.
2. The AIO decides whether to proceed with the allegation and you will be notified of the process.
3. If the case proceeds, you will receive an INC (incomplete) grade until the matter is resolved.
4. If you are found guilty of an academic offence, a penalty will be assigned ranging from a warning to a suspension or expulsion from the University and can include a notation on your transcript, failure of the assignment or failure of the course. All penalties are academic in nature.

Where can you turn for help?

- If you are ever unsure about ANYTHING, contact myself.
- The Academic Integrity website (<http://academicintegrity.dal.ca>) has links to policies, definitions, online tutorials, tips on citing and paraphrasing.
- The Writing Center provides assistance with proofreading, writing styles, citations.
- Dalhousie Libraries have workshops, tutorials, citation guides, Assignment Calculator, RefWorks, etc.
- The Dalhousie Student Advocacy Service assists students with academic appeals and student discipline procedures.
- The Senate Office provides links to a list of Academic Integrity Officers, discipline flow chart, and Senate Discipline Committee.

¹Based on the sample statement provided at <http://academicintegrity.dal.ca>.

10 Student Accommodation

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic under the Nova Scotia Human Rights Act. Students who require academic accommodation for either classroom participation or the writing of tests and exams should make their request to the Advising and Access Services Center (AASC) prior to or at the outset of the regular academic year. Please visit www.dal.ca/access for more information and to obtain the Request for Accommodation Form A.

A note taker may be required as part of a student's accommodation. There is an honorarium of \$75/course/term (with some exceptions). If you are interested, please contact AASC at 494-2836 for more information.

Please note that your classroom may contain specialized accessible furniture and equipment. It is important that these items remain in the classroom, untouched, so that students who require their usage will be able to participate in the class.

11 Culture of Respect

Every person has a right to respect and safety. We believe inclusiveness is fundamental to education and learning. Misogyny, racism, homophobia, transphobia, and other disrespectful behaviour in our classrooms, on our campus, on social media, and in our community is unacceptable. As a community, we must stand for equality and hold ourselves to a higher standard.

What we all need to do ²:

1. **Be Ready to Act:** This starts with promising yourself to speak up to help prevent it from happening again. Whatever it takes, summon your courage to address the issue. Try to approach the issue with open-ended questions like “Why did you say that?” or “How did you develop that belief?”
2. **Identify the Behaviour:** Use reflective listening and avoid labelling, name-calling, or assigning blame to the person. Focus the conversation on the behaviour, not on the person. For example, “The comment you just made sounded racist, is that what you intended?” is a better approach than “You’re a racist if you make comments like that.”
3. **Appeal to Principles:** This can work well if the person is known to you, like a friend, sibling, or co-worker. For example, “I have always thought of you as a fair-minded person, so it shocks me when I hear you say something like that.”
4. **Set Limits:** You cannot control another person's actions, but you can control what happens in your space. Do not be afraid to ask someone “Please do not tell racist jokes in my presence anymore” or state “This classroom is not a place where I allow transphobia to occur.” After you have set that expectation, make sure you consistently maintain it.
5. **Find or be an Ally:** Seek out like-minded people that support your views, and help support others in their challenges. Leading by example can be a powerful way to inspire others to do the same.
6. **Be Vigilant:** Change can happen slowly, but do not let this deter you. Stay prepared, keep speaking up, and do not let yourself be silenced.

²Source: Speak Up! ©2005 Southern Poverty Law Center. First Printing. This publication was produced by Teaching Tolerance, a project of the Southern Poverty Law Center. Full “Speak Up” document found at: <http://www.dal.ca/dept/dalrespect.html> Revised by Susan Holmes from a document provided April 2015 by Lyndsay Anderson, Manager, Student Dispute Resolution, Dalhousie University 902.494.4140 lyndsay.anderson@dal.ca www.dal.ca/think.