Department of Mathematics and Computer Science
Adelphi University
Fall 2017

0145-270-002 **Survey of Programming Languages**

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Office Hours Tu 10AM-12Noon; W 11:00-11:50AM; F1-2PM

Course Description and Purpose
Learn to use different approaches to programming, and languages and language features that support them: object-oriented (e.g. C++, Java), functional (e.g. Scheme, Haskell), and logical (e.g. Prolog). By the end of the course, students can learn new languages quickly, and choose appropriate language and approach(es) for any given programming assignment.

Gen Ed Learning Goals and Distribution Requirements
Quantitative Reasoning
Formal Sciences

Course Learning Goals
Students will be able to write basic programs in the Scheme and Prolog programming languages and how to write object-oriented programs in the C and C++ programming languages.

Prerequisite CSC 172

Texts

C: How to Program, 8th ed. by Paul Deitel and Harvey Deitel, Pearson, 2016.

How to Design Programs: An Introduction to Programming and Computing, 1st ed., by Matthias Felleisen, Robert Bruce Findler, Matthew Flatt, and Shriram Krishnamurthi, The MIT Press, Cambridge, MA, 2001. (also available at http://htdp.org)

Learn Prolog Now! (Texts in Computing, Vol. 7) by Patrick Blackburn, Johan Bos, and Kristina Striegnitz. College Publications, London, 2006. (also available at http://www.learnprolognow.org)

Topics

C:

- Getting Started in C
- Modular Programming I: Functions
- Arrays and Structures
- Strings
- Bitwise Operations

Pointers and Dynamic Arrays
Input/Output in C

C++:

C++ As A Better C
Dynamic Arrays in C++
Strings
Classes, Constructors and Destructors
Separate Compilation and Namespaces
File I/O
Inheritance, Polymorphism and Virtual Functions
Exception Handling

Scheme:

Processing Simple Forms of Data
Conditional Expressions and Programs
Symbolic Information
Compound Data: Structures and Lists
The Varieties of Data
Syntax and Semantics
Natural Numbers
An Extended Example: Sorting

Prolog:

Facts, Rules, and Queries
Unification and Proof Search
Recursion
Lists
Arithmetic
Definite Clause Grammars
Cuts and Negation

Assignments

The assignments this semester will require students to use DrRacket to design, code, debug and submit programs written in the Scheme (Racket) programming languages. Students will be expected to use vi or another text editor and the gcc and g++ compilers on Panther to design, code, debug and submit programs written in C and C++. Students will be expected to use SWI Prolog to design, code, debug and submit programs written in Prolog. Students are expected to install DrRacket, SWI Prolog and PuTty or alternate programs that are approved by the instructor if they wish to work on assignments on their personal computers.

While there will be opportunities to use class time for assigned work, this will usually be limited to debugging and other assistance that students require in class. One should

expect to spend 4-6 hours outside class working on programming assignments for this class.

Students are expected to turn in assignments in hardcopy; if you wish, you may submit it through Moodle. ***NO ASSIGNMENTS WILL BE ACCEPTED BY E-MAIL.***

Grading

Each programming assignment will be graded with a base grade of 90%, with points added to reflected areas in which the assignment exceeded specified requirements and/or points deducted to show areas where the assignment is deficient.
Late penalties may be assessed of 2 points per class after the due date.
The final average will be weighted (based on the following ratio:

Programming Assignments	30%
In-Class Exams	35%
Final Exam	35%

The final average will translate to a letter grade according to the following table:

Final Average	Course Grade
A	90 – 100
A-	87.5 – 89.9
B+	83.3 – 87.4
B	80.0 – 83.2
B-	77.5 – 79.9
C+	73.3 – 77.4
C	70.0 – 73.2
C-	67.5 – 69.9
D+	63.3 – 67.4
D	60.0 – 63.2
F	0.0 – 59.9

Attendance

The following is the Adelphi University General Attendance Policy:
Only students who are registered for courses, and whose name appears on the Official Class Roster may attend courses at the University. Adelphi students make a commitment to be active participants in their educational program; class attendance is an

integral part of this commitment. Attendance requirements for each course will be announced by the faculty member at the beginning of each term. Students are expected to be present promptly at the beginning of each class period, unless prevented by illness or by other compelling cause. In the event of such absence, students may request that faculty members be notified by the Office of Academic Services and Retention. Students are responsible for completing course work missed through absences. Students should wait a reasonable length of time for an instructor in the event that the instructor is delayed.

Additionally, you are also responsible for whatever work is covered in class whether or not you are there. Absence from the final exam will be excused only for a good and well-documented reason. The decision to allow a make-up exam will be made in accordance with the policies of Adelphi University.

NB: The class will NOT meet on Friday, September 22. We will make up this class by meeting on Tuesday December 5.

Additionally, Friday, October 6 and Friday, October 13 will be lab days. Attendance will be taken and you will have the opportunity to submit assignments that are due.

If the University is closed for more than two days due to an emergency, go the home page for this course site each day for instructions and assignments. Student instructions materials can be found at http://home.adelphi.edu/~siegfried/cs270

Tentative Schedule (Subject to Change)

Date	**Topic**	**Assignment due**
August 28	Getting Started in C	
August 30	Modular Programming I: Functions in C	Assn 1 - Converting a temperature from Kelvin to Celsius and Fahrenheit
September 1	Lab	Assn 2 - Finding out the batting averages for the starting line-up
September 6	Arrays and Structures in C	Assn 3 – A payroll program that uses functions
September 8	Strings in C	
September 11	Lab	
September 13	Bitwise Operator and Operations Miscellany in C	Assn 4 – Replacing “is” with “was”

September 15	Pointers and Dynamic Arrays in C	
September 18	Lab	Assn 5 – Working with Bitwise operators
September 20	Input/Output in C	Assn 6 – Manipulating a Dynamic Array in C
September 22	***No class – to be made up on December 5***	
September 25	Review for C Exam	Assn 7 – Using Text Files for input and output in C
September 27	Exam on C	
September 29	C++ As A Better C	Assn 8 – Using binary files in C
October 2	Strings in C++	Assn 9 – Calculating the batting averages in C++
October 4	Introducing Objects in C++	
October 6	Lab	Assn 10 - Manipulating a Dynamic Array in C++
October 11	More on Writing Classes in C++	
October 13	Lab	Assn11 – Replacing “is” with “was using C++’s String class
October 16	Inheritance in C++	
October 18	Exception Handling in C++	Assn 12 - Finding the Average of Numbers Stored in a Text File in C++
October 20	Lab	Assn 13 – Creating a phone book
October 23	Review for Exam on C++	Assn 14 – Finding the average of non-negative numbers
October 25	Exam on C++	
October 27	Processing Simple Forms of Data in Scheme	
October 30	Conditional Expressions and Programs in Scheme	Assn 15 – Evaluating Expressions
November 1	Symbolic Information in Scheme	Assn 16 - Calculating Distance Traveled
November 3	Compound Data I: Structures in Scheme	Assn 17 - Avoiding the Speed Trap
November 6	The Varieties of Data in Scheme	Assn 18 - Avoiding the Speed Trap II: Printing a Message
November 8	Syntax and Semantics in Scheme	Assn 19 - Converting Feet and Inches to Inches

November 10	Compound Data II: Lists in Scheme	Assn 20 - How High Is Your Income Tax?
November 13	More on List Processing in Scheme	Assn 21 - A More Realistic Payroll Program
November 15	Review for Exam on Scheme	Assn 22 - "Is he or she tall?"
November 17	Exam on Scheme	Assn 23 - Finding the area of a circle, square or rectangle
November 20	Facts, Rules and Queries in Prolog	Assn 24 - Searching a List for an Item
November 27	Unification and Proof Search in Prolog	Assn 25 - The Average of Numbers on a List
November 29	Recursion in Prolog	
December 4	Lists in Prolog	Assn 27 – Ex. 1.1, 1.2, 1.4
December 5	Arithmetic in Prolog	
December 6	Review for Exam on Prolog	Assn 28 – Ex 2.1, 2.2, 2.3
December 8	Prolog Exam	Assn 29 – Ex 3.1, 3.2, 3.4
December 11	Review for Final Exam	
TBA	Final Exam	

Students With Disabilities

If you have a disability that may significantly impact your ability to carry out assigned coursework, please contact the Student Access Office (SAO) at 516-877-3806 or send an email to sao@adelphi.edu. The staff will review your concerns and determine, with you, appropriate and necessary accommodations. Please allow for a reasonable time frame for requesting ASL Interpreters or Transcription Services.

Honor Code

Students enrolled in this course are expected to abide by the Adelphi University Honor Code. The purpose of the Honor Code is to protect the academic integrity of the University by encouraging consistent ethical behavior in assigned coursework by students. Following is excerpted from the Student Honor Code:

The code of academic honesty prohibits behavior, which can broadly be described as lying, cheating, or stealing. Violations of the code of academic honesty will include, but are not limited to, the following:

1. Fabricating data or citations
2. Collaborating in areas prohibited by the professor
3. Unauthorized multiple submission of work
4. Sabotage of others' work, including library vandalism or manipulation
5. Plagiarism: presenting any work as one's own that is not one's own
6. The creation of unfair advantage
7. The facilitation of dishonesty
8. Tampering with or falsifying records

9. Cheating on examinations through the use of written materials or giving or receiving help in any form during the exam, including talking, signals, electronic devices, etc.

Student Course Evaluations

During the last two weeks of the class, you will receive notification, via mail and eCampus, that the course evaluation is available for your input electronically. Availability will end at the start of the final examination period. Your feedback is valuable and I encourage you to respond. Please be assured that your responses are anonymous and the results will not be available to the instructor until after the end of the semester and therefore after course grades have been submitted.

Tear off this and return with information required below:

STUDENT ACKNOWLEDGEMENT:

I HAVE RECEIVED AND READ THE SYLLABUS FOR [INSERT COURSE NUMBER AND SECTION].

SIGNED: _____

PRINT NAME:

_____

DATE: _____

Warning – This page must be signed and returned to the instructor to receive a complete grade in this course.