



Spring 2013 — COSC 455.001

Programming Languages: Design and Implementation

Time and Location

Tuesday: 2:00pm – 3:15pm YR201
Thursday: 2:00pm – 3:15pm YR304

Instructor Information

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Course Site: <http://bbweb.towson.edu>

Course Description

Underlying concepts in high-level programming languages and techniques for their implementation, a survey of a selected group of such languages along with a discussion of the interrelationship between programming and programming languages.

Prerequisite: COSC336.

Required Textbooks

***Modern Programming Languages*, 2nd edition** — Adam Brooks Webber

Franklin, Beedle & Associates

ISBN: 1590282507

Course Objectives

- Recognize the fundamental concepts that make up most high-level programming languages
- Understand the trade-offs between language design and implementation
- Appreciate how/why concepts or features in different programming languages are selected
- Know the process involved in the design of a high-level programming language
- Be aware of data type definitions and implementations
- Understand the design of programming control structures
- Comprehend different programming language paradigms (e.g., functional, object-oriented, imperative)

Grading

Assignment Weights:

Exam 1	20%
Exam 2	20%
Final Exam	20%
Programming Projects	30%
Presentation	05%
Homework/Attendance	05%

Grading Scale (in %):

A	≥ 95.00	C+	77–79.99
A–	90–94.99	C	70–76.99
B+	87–89.99	D+	67–69.99
B	83–86.99	D	60–66.99
B–	80–82.99	F/FX	≤ 59.99

For more information regarding university wide grading policies see:

<http://www.towson.edu/registrar/records/gradeolicies.asp>

Homework and Exams

- **Readings:** *Textbook Reading* assignments will *not* generally be *explicitly* given on a daily basis, as a weekly topic/chapter schedule is provided below. Class discussions will be based on the premise that the students have read the material from the text outlined in the schedule.
 - Note: The schedule is broken down by the week and not the specific day of that week. This is intentional to allow flexibility to spend a little more time on a given topic if necessary.
 - Additional reading assignments will be given as the semester progresses. These readings will generally be from various web-sites or provided papers.
- **Homework:** Homework assignments will be given a due date/time specified with the assignment. If left unspecified, any given assignment will be due at the start of class one week from the date assigned.
 - Any/all homework are purely for your benefit and are carefully selected to reinforce the important concepts which have been discussed. As such, they will simply be graded on a “S/U” basis and select solutions will be provided after the assignment’s due date.
- **Programming Projects:** Programming Assignments will be given a due date/time specified with the assignment.
 - There will be 3-4 significant programming projects given throughout the semester. All projects will be given to provide students ample time to complete. Students should start early and frequently check in their work to the department Subversion server. Students are reminded that the instructor is available for help during office hours and otherwise through email or appointments.
- **Exams:** There will be two mid-semester exams and one final exam given during finals week.
 - **Missed exams may not be made up without *prior approval* from the instructor, or satisfactory written documentation of an emergency situation.**
 - See the undergraduate catalog for information pertaining to University attendance policies and guidelines for excused absences.
 - The instructor will keep all completed exams on file and the student shall not be permitted to retain the exam or copies thereof. Any student wishing to review the exam in greater detail should make an appointment with the instructor (and I'll be happy to go over it with you in person).

- **Presentation:** This is not a “group project” in the traditional of scale and scope, but small teams should be formed to research a particular language and give a short presentation to the class on that language. The scope and details of this project is details will be discussed in class.

Assignment and Submission

- **Blackboard:** Unless otherwise noted, all assignments are to be submitted to *Blackboard* using the submission link associated with each assignment. (<https://bbweb.towson.edu>)
 - No hard-copies or emailed assignments will be accepted unless specifically permitted in the assignment instructions or by express permission of the instructor. See the following links for tutorials and system requirements:
 - <http://www.towson.edu/Blackboard/minimum.asp>
 - <http://www.towson.edu/Blackboard/studentresources.asp>
- **Late assignments:** Late Assignments will not be accepted for credit without *prior approval* or a documented, university approved absence.
 - If you are having difficulty completing an assignment on time (and require additional assistance), you should contact the instructor before the due date. Submitting incomplete assignments that demonstrate significant progress towards a solution may be awarded partial credit.
- **Submission Verification:** You are responsible for verifying the proper submission of your assignments to *Blackboard* throughout the semester. Any submission problem should be brought to the instructors attention as soon as possible, but after double checking the technology requirements and *Blackboard* outage announcements.
- **SUBMISSION NOTES:** Please do not submit/paste assignment solutions to the “comments” area on the assignment submission screen! Please *attach/upload* all files that you wish to submit. You may attach multiple files individually or in a ZIP, RAR, or 7z, archive.
 - If you make a mistake while submitting, you may resubmit anytime before the due date/time, but please resubmit *all* of your work; “resubmissions” completely *replace* any previous submission.

Attendance

- **General:** All students are expected to be on-time for – and remain for the duration of – all class sessions unless the instructor is otherwise notified prior to the start of class.
- **Record Keeping:** Attendance may be taken at any time during regularly scheduled lecture or lab sessions of the course.
- **Missed information:** Though the student is solely responsible for all acquiring any information missed due to an absence. Assignments and select lecture notes will be posted on *Blackboard* as they become available; you should check *Blackboard*, the syllabus, and/or with classmates *for information about any newly posted assignments*.
 - However, *Blackboard* is *not* a replacement for class attendance; not every instruction given in class will necessarily be repeated on *Blackboard*.
 - Assignments are expected to be submitted on time regardless of your attendance on a particular day.

- **Absences and Grading:** (NEW POLICY) Since the most valuable part of a traditional classroom/lecture setting is mutual interaction, this course will weight attendance and participation as a small part of the overall grade.
 - Since unforeseen circumstances and emergencies do occasionally arise, a limited number of *unexcused* absences will be permitted without penalty. The number of accepted *unexcused* “class-hours” will be equal to the number of “credit-hours/units” of the course. (In other words, a number of class-hours equivalent to one week).
 - Unexcused absences exceeding the policy outlined above will result in a deduction from the “Attendance” grading category proportional to the number the number of class-hours missed.

Classroom Policies

- **Personal Computing Devices:** The instructor reserves the right to prohibit the use of personal computing devices during lecture, especially if such use is deemed distracting or disruptive to the classroom environment (or to the instructor). This determination will be made at the sole discretion of the instructor.
- **Cell Phones:** Cell phones should be silenced before the start of class.
- **Extra Credit:** It is the intent of the instructor to make all grading fair and uniform. To this end, “subjective” grading and individualized extra credit assignments will not be given and all grading criteria will apply uniformly to all students.
- **Email:** When contacting the instructor with a question, your email should originate from your university assigned student email address and contain a **reference to the course and section you are taking**. Email received from other accounts may be blocked (by any number of spam filters). Additionally, any email send to the class as a whole will be delivered to your student account, so be sure to set up “mail forwarding” if you do not often check your towson.edu account.

University Policies

- **Academic integrity:** Student should consult the Student Academic Integrity Policy.
 - It should be noted that the instructor is **obligated** to report any incidents of academic dishonesty to the office of Academic Affairs.
 - Occurrences of cheating or plagiarism (including the submission of source code copied from the Internet) may yield a failing grade for the assignment or course, and are subject to the university established academic integrity policies:
 - <http://www.towson.edu/provost/resources/studentacademic.asp>
- **Course repeat policy:** Students may not repeat a course more than once without prior permission of the Academic Standards Committee.
- **Special Needs:** Students with special needs should contact the instructor at the beginning of the semester to discuss any additional assistance required. Every effort will be made to accommodate those requests.
- **Other:** For any issues not specifically addressed in this syllabus, the student should consult the Towson University Undergraduate Catalog:
 - <http://www.towson.edu/main/academics/ugrad/undergraduatecatalog.asp>

Software Downloads

If you wish to install the course software on a personal machine, you are encouraged to do so, as all programs are freely available and available. Please see the text books author's website:

<http://www.webber-labs.com/mpl.html>

Additional Software Sources (all of the following tools should be available for *Linux*, *Windows*, and *MacOS*):

- **Parser Generators**
 - [ANTLRWorks+ANTLR](#)
 - [Lex/YACC](#)
- **Functional Programming**
 - [Alice](#) (extension of Standard ML with a GUI and debugging tools)
 - [Standard ML of New Jersey](#) (used by our text)
 - [Scala](#), [Haskell](#)
- **Object Oriented and Procedural Programming**
 - [Java](#)
 - [C/C++](#) (GCC)
 - *Linux*: The GCC compilers and tools are [almost always included](#).
 - *Windows*: The [MinGW](#) and [Cygwin](#) both contain implementations of GCC
 - *MacOS*: GCC is available with [Xcode](#) (but you're on your own with anything *Apple*)
- **Logic Programming**
 - [SWI-Prolog](#)

Tentative Schedule* :

Week #	Week of (Monday)	Topic(s)
1	Jan 28th	• <i>Course Introduction</i> • Chapter 24: The History of Programming Languages • Chapter 1: Programming Languages • Additional Content: <i>6502 Assembly Language Programming</i>
2	Feb 4 th	• Chapter 2: Defining Program Syntax • Chapter 3: Where Syntax Meets Semantics (Introduction)
3	Feb 11 th	• Chapter 3: Where Syntax Meets Semantics
4	Feb 18 th	• Chapter 4: Language Systems
5	Feb 25 th	• Exam 1 • Chapter 5: A First Look at ML (Really... just functional languages in general)
6	Mar 4 th	• Chapter 5: A First Look at ML (Cont.) • Chapter 6: Types
7	Mar 11 th	• Chapter 7: A Second Look at ML • Chapter 9: A Third Look at ML
—	Mar 18 th	Spring Break
8	Mar 25 th	• Chapter 8: Polymorphism • Chapter 9: A Third Look at ML (Cont.)
9	Apr 1st	• Chapter 10: Scope • Chapter 11: A fourth Look at ML
10	Apr 8 th	• Catch up / Additional Content / Review
11	Apr 15 th	• Exam 2 • Chapter 12: Memory Locations for Variables • (Prolog Preliminaries)
12	Apr 22nd	• Chapter 14: Memory Management • Chapter 18: Parameters • Chapter 19,20,22: Prolog (Taken together over the remaining weeks)
13	Apr 29 th	• Chapter 19,20,22: Prolog (Taken together over the remaining weeks) • Presentations from teams 1, 2
14	May 6 th	• Chapter 19,20,22: Prolog (Taken together over the remaining weeks) • Presentations from teams 3, 4, 5, 6
15	May 13 th	• Catchup / Review / Additional Concepts • Presentations from teams 7, 8, 9, 10
Final Exam	May 20 th	20-May Monday 12:30PM - 2:30PM YR 302 See: http://www.towson.edu/registrar/calendars/exams.asp

* Please note that all scheduled dates are tentative and additional topics will be introduced to augment the material in the text. Class progress, university closings, etc. may necessitate alteration of the schedule. Unless extenuating circumstances arise, the exam dates will remain fixed; only the chapter coverage of the exam will change if we have failed to cover the given chapters by an exam date.