Course Description

Instructor: Prof. Richard Chang <chang@umbc.edu>

Office Hours: Tue&Thu 3:00pm – 4:00pm (in person ITE 326)

Wed: 1:30pm – 2:30pm (online https://meet.google.com/cgc-bkzn-hwv)

Teaching Assistant: Sean Moulton <gk31179@umbc.edu>

Office Hours: TBA

Grader: Prerana Bollineni <preranb1@umbc.edu>

Course Web Page: http://umbc.edu/~chang/cs331

Time & Place.

Tue & Thu 1:00pm – 2:15pm, Sondheim 110

Textbooks.

Programming Languages: Principles and Practice, third edition,
Kenneth C. Louden and Kenneth A. Lambert. Cengage Learning, 2012 (ISBN: 9780124104099)

Programming in Haskell, 2nd edition, Graham Hutton.
Cambridge University Press, 2016 (ISBN: 9781316626221)

Prerequisites. Students enrolled in this class must have completed CMSC 202 Computer Science II and CMSC 203 Discrete Structures with a grade of C or higher.

Objectives. The key learning objectives for this course are:

- To understand how programming languages have and continue to evolve
- To learn about formal definition and specification of programming languages
- To learn about different programming paradigms, and gain some experience in several
- To study how programming languages are implemented

Grading. Grades will be based upon the following distribution

Homework (10)	30%
Midterm Exams (2)	40%
Final Exam	30%

The schedule as planned has 12 homework assignments. However, if a homework assignment is canceled and not made up, homework assignments would still be 36% of your final grade — each homework assignment would be worth more.

The final letter grade is based on the standard formula:

$$0 \le F < 60, \quad 60 \le D < 70, \quad 70 \le C < 80, \quad 80 \le B < 90, \quad 90 \le A \le 100$$

Grades will not be "curved" — that is, the percentages of A's, B's and C's are not fixed. However, depending upon the distribution of grades in the class, there may be adjustments in the students' favor, but under no circumstances will the letter grades be lower than in the standard formula.

Grades are given for work done *during* the semester; incomplete grades will only be given for medical illness or other such dire circumstances. In particular, taking a heavy course load is not a legitimate excuse for receiving an incomplete.

Exams & Required Reading. There are two midterm exams (March 13, April 24) and the final exam (May 20). See class schedule. Exams must be taken in-person. Exam topics will be chosen from the **required reading**, lectures and homework assignments. *You are responsible for the material in the textbooks even if it is not covered in lecture.*

Lectures. This is an in-person class. Your attendance is expected. Some lectures will present topics that are not in the textbooks. You will be responsible for that content for homework and exams.

Lectures will be recorded and shared on Google Drive on a **best effort basis**. However, if a lecture or part of a lecture was not recorded, say due to some mishap with technology, you are still responsible for the content of the lecture.

Homework. Written work will be submitted online in PDF. You can prepare your written work electronically or scan in handwritten sheets. If you scan in your work, please make sure that you use a good scanning app that corrects the lighting and keystoning. Both the Apple App Store and the Google Play Store have many good inexpensive scanning apps.

Programming assignments will be submitted on GL.

A significant portion of your grade for programming assignments (up to 40%) will depend on **good usage** of designated programming language features. Thus, a program that produces the correct output might still receive a very low grade if it does not demonstrate good usage of the designated features.

Late Homework. Homework assignments are due by 11:59pm on Thursdays. Unexcused late homework will be penalized as follows:

1 day late (by Friday 11:59pm)	-5%
2 days late (by Saturday 11:59pm)	-10%
3 days late (by Sunday 11:59pm)	-20%
4 days late (by Monday 11:59pm)	-40%
before next class (by Tuesday **1:00pm**)	-100%

Late homework will not be accepted after the start of the next lecture. This allows for timely grading and discussion.

Three times during the semester, you will be allowed to submit a late homework assignment without excuse and without penalty one lecture late (e.g., homework due on Thursday may be submitted on Tuesday without penalty). One full-credit unexcused late assignment will be accepted for Homework 1-4, one for Homework 5-7 and another for Homework 8-10. You do not accrue any credit for submitting homework assignments on time. For example, if you submitted all of Homework 1-7 on time, you can still only turn in one of Homework 8-10 late for full credit.

Homework Policy. You are allowed to discuss the homework assignments including the programming portions with other students verbally. However, you should *never* look at another student's code. Homework should be written up *independently*. **All cases of academic misconduct will be reported to the UMBC Academic Conduct Committee**.

The UMBC academic integrity policy is available at: <https://tinyurl.com/yd26tx2d>

University Policies and Resources. UMBC Policies on Accessibility & Disability Accommodations; Sexual Assault, Sexual Harassment, Gender Based Violence & Discrimination; Pregnancy and Parenting; Religious Observances & Accommodations; and Hate, Bias Discrimination & Harassment are described at the Office of Equity & Inclusion's website.

CMSC 331 Principles of Programming Languages, Section 03, Class Schedule

		PL Topics	Louden & Lambert	Haskell Topics	Hutton	HW Assign	HW Due
1	**Tue Jan 28**	Introduction + PL Design Criteria	Ch1 + Ch2				
2	**Thu Jan 30**	Functional Progamming	Ch3	Intro to Haskell	1.1-1.4, 2.1-2.5	HW1	
3	**Tue Feb 04**	Logic Programming	Ch4	Lists, tuples and functions	3.1-3.9		
4	**Thu Feb 06**	Object-oriented Programming	Ch5	Haskell functions	4.1-4.3	HW2	HW1
5	**Tue Feb 11**	Syntax & Regular Expressions	6.1	Haskell functions	4.4-4.6		
6	**Thu Feb 13**	Syntax & Context-free Grammars	6.2	List comprehensions	5.1-5.3	HW3	HW2
7	**Tue Feb 18**	Parse Trees	6.3-6.5	List comprehensions	5.4-5.6		
8	**Thu Feb 20**	Parsing Techniques	6.6	Recursion	6.1-6.2	HW4	HW3
9	**Tue Feb 25**	Parsing Techniques		Recursion	6.3-6.6		
10	**Thu Feb 27**	Parsing Techniques		Higher-order functions	7.1-7.3	HW5	HW4
11	**Tue Mar 04**	Syntax wrap-up	6.7-6.8	Higher-order functions	7.4-7.7		
12	**Thu Mar 06**	Semantics	7.1-7.3				HW5
13	**Tue Mar 11**	Semantics	7.4-7.8	**Midterm Review**			
14	**Thu Mar 13**	***Midterm Exam I***					
	Tue Mar 18	***Spring Break***					
	Thu Mar 20						
15	**Tue Mar 25**	Automata Theory		Types and classes	8.1-8.3		
16	**Thu Mar 27**	Data Types	8.1-8.5	Types and classes	8.4-8.6	HW6	
17	**Tue Apr 01**	Data Types	8.6-8.10	Haskell Input & Output	10.-10.5		
18	**Thu Apr 03**			Monads	12.1 - 12.3	HW7	HW6
19	**Tue Apr 08**	Control I: Expressions & Statements	9.1-9.6	Monads			
20	**Thu Apr 10**	Control II: Procedures	10.1-10.3	Foldables	14.2	HW8	HW7
21	**Tue Apr 15**	Control II: Environments	10.4-10.5	Traversables	14.3		
22	**Thu Apr 17**	Control II: Exceptions	10.6-10.7	Lazy Evaluation	15.1-15.7		HW8
23	**Tue Apr 22**	Abstract Data Types	11.1-11.4	**Midterm Review**			
24	**Thu Apr 24**	***Midterm Exam II***				HW9	
25	**Tue Apr 29**	Modules	11.5-11.8				
26	**Thu May 01**	Formal Semantics	12.1-12.4			HW10	HW9
27	**Tue May 06**	Program Correctness	12.5				
28	**Thu May 08**	Parallel Programming	13.1-13.7				HW10
29	**Tue May 13**	**Final Exam Review**					
	Tue May 20	**1:00pm - 3:00pm Final Exam**					