

## Course Description

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

In-person office hours (ITE 326): Tue & Thu 12:30pm – 2:00pm

Online office hours: Wed 2:00pm - 3:00pm

**Teaching Assistant:** Saiteja Peddi <speddi1@umbc.edu>

In-person office hours (ITE 344): Mon & Thu 2pm – 3pm

**Grader:** Sai Kumar Vaddepally <ci94858@umbc.edu>

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

### Time & Place.

Tue & Thu 10:00am – 11:15am, ITE 233

### Textbooks.

*Programming Language Pragmatics* 4th edition, Michael L. Scott.  
Morgan Kaufmann, 2016 (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

Attendance	4%
Homework (12)	36%
Haskell Quizzes (4)	16%
Midterm Exam	20%
Final Exam	24%

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:

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

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.

**Attendance.** Lectures will be recorded but attendance will be taken starting the second week of classes (after the add/drop period is over). You may be excused for up to 3 absences. If you miss a lecture, you can make up the points by completing an online attendance quiz before 9:00am on the next Monday. Note that you will receive 100% of attendance points by being physically present for a lecture, but you will lose credit if you answer the questions of the attendance quiz incorrectly.

**Haskell Quizzes & Exams.** There are four Haskell quizzes, one midterm exam and one final exam. (See class schedule.) The Haskell quizzes and exams must be taken in-person.

**Homework Submission.** 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 keystoneing. Both the Apple App Store and the Google Play Store have many good inexpensive scanning apps.

Programming assignments will be submitted on GL.

**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 10am)	-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 5-8 and another for Homework 9-12. You do not accrue any credit for submitting homework assignments on time. For example, if you submitted all of Homework 1-8 on time, you can still only turn in one of Homework 9-12 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.**

## University Resources & Policies

UMBC's academic integrity policy is available [here](#).

**Retriever Essentials** <<https://retrieveressentials.umbc.edu/>> is a faculty, staff, and student-led partnership that addresses food insecurity in the UMBC community. They offer free groceries, toiletries, baby items, and meal swipes, and have opportunities to engage and volunteer. Pick up items from their pantry, [The Essential Space](#), located in RAC 235 or get a pre-assembled bag of non-perishable food items and personal care products at one of their [Food Zones](#). Email [retrieveressentials@umbc.edu](mailto:retrieveressentials@umbc.edu) about their meal swipe program or to find out how to [volunteer](#) with them.

### **Accessibility and Disability Accommodations, Guidance and Resources:**

Accommodations for students with disabilities are provided for all students with a qualified disability under the Americans with Disabilities Act (ADA & ADAAA) and Section 504 of the Rehabilitation Act who request and are eligible for accommodations. The Office of Student Disability Services (SDS) is the UMBC department designated to coordinate accommodations that creates equal access for students when barriers to participation exist in University courses, programs, or activities.

If you have a documented disability and need to request academic accommodations in your courses, please refer to the SDS website at [sds.umbc.edu](https://sds.umbc.edu) for registration information and office procedures.

SDS email: [disAbility@umbc.edu](mailto:disAbility@umbc.edu)

SDS phone: 410-455-2459

If you will be using SDS approved accommodations in this class, please contact the instructor to discuss implementation of the accommodations. During remote instruction requirements due to COVID, communication and flexibility will be essential for success.

### **Sexual Assault, Sexual Harassment, and Gender Based Violence and Discrimination:**

[UMBC Policy](#) in addition to federal and state law (to include Title IX) prohibits discrimination and harassment on the basis of sex, sexual orientation, and gender identity in University programs and activities. Any student who is impacted by sexual harassment, sexual assault, domestic violence, dating violence, stalking, sexual exploitation, gender discrimination, pregnancy discrimination, gender-based harassment, or related retaliation should contact the University's Title IX Coordinator to make a report and/or access support and resources. The Title IX Coordinator can be reached at [titleixcoordinator@umbc.edu](mailto:titleixcoordinator@umbc.edu) or 410-455-1717.

You can access support and resources even if you do not want to take any further action. You will not be forced to file a formal complaint or police report. Please be aware that the University may take action on its own if essential to protect the safety of the community.

If you are interested in making a report, please use the [Online Reporting/Referral Form](#). Please note that, if you report anonymously, the University's ability to respond will be limited.

Notice that Faculty and Teaching Assistants are Responsible Employees with Mandatory Reporting Obligations

All faculty members and teaching assistants are considered Responsible Employees, per UMBC's [Policy on Sexual Misconduct, Sexual Harassment, and Gender Discrimination](#). Faculty and teaching assistants therefore required to report all known information regarding alleged conduct that may be a

violation of the Policy to the Title IX Coordinator, even if a student discloses an experience that occurred before attending UMBC and/or an incident that only involves people not affiliated with UMBC. Reports are required regardless of the amount of detail provided and even in instances where support has already been offered or received.

While faculty members want to encourage you to share information related to your life experiences through discussion and written work, students should understand that faculty are required to report past and present sexual harassment, sexual assault, domestic and dating violence, stalking, and gender discrimination that is shared with them to the Title IX Coordinator so that the University can inform students of their [rights, resources, and support](#). While you are encouraged to do so, you are not obligated to respond to outreach conducted as a result of a report to the Title IX Coordinator.

If you need to speak with someone in confidence, who does not have an obligation to report to the Title IX Coordinator, UMBC has a number of [Confidential Resources](#) available to support you:

- [Retriever Integrated Health](#) (Main Campus): 410-455-2472; Monday – Friday 8:30 a.m. – 5 p.m.; For After-Hours Support, Call 988.
- [Center for Counseling and Well-Being](#) (Shady Grove Campus): 301-738-6273; Monday-Thursday 10:00a.m. – 7:00 p.m. and Friday 10:00 a.m. – 2:00 p.m. (virtual) [Online Appointment Request Form](#)
- Pastoral Counseling via [The Gathering Space for Spiritual Well-Being](#): 410-455-6795; [i3b@umbc.edu](mailto:i3b@umbc.edu); Monday – Friday 8:00 a.m. – 10:00 p.m.

### **Other Resources**

- [Women's Center](#) (open to students of all genders): 410-455-2714; [womenscenter@umbc.edu](mailto:womenscenter@umbc.edu); Monday – Thursday 9:30 a.m. – 5:00 p.m. and Friday 10:00 a.m. – 4 p.m.
- [Shady Grove Student Resources](#), [Maryland Resources](#), [National Resources](#).

### **Child Abuse and Neglect**

Please note that Maryland law and [UMBC policy](#) require that faculty report all disclosures or suspicions of child abuse or neglect to the Department of Social Services and/or the police even if the person who experienced the abuse or neglect is now over 18.

**Additional UMBC Policies** on Pregnancy and Parenting; Religious Observances & Accommodations; and Hate, Bias Discrimination & Harassment are described at the [Office of Equity & Civil Rights website](#).

## CMSC 331 Principles of Programming Languages, Section 01, Class Schedule

	PL Concepts	ML Scott	Haskell	Hutton	HW Assign	HW Due
1	<b>Thu Aug 31</b>	Introduction	Ch1			
2	<b>Tue Sep 05</b>	Prolog & FORTH	Ch12.1-2	Intro to Haskell	1.1-1.4	
3	<b>Thu Sep 07</b>	Functional Programming		Installing Haskell	2.1-2.5	HW1
4	<b>Tue Sep 12</b>	Syntax Intro	2.1	Lists, tuples and functions	3.1-3.9	
5	<b>Thu Sep 14</b>	Regular Expressions		Haskell functions	4.1-4.3	HW2 HW1
6	<b>Tue Sep 19</b>	Scanning	2.2	Haskell functions	4.4-4.6	
7	<b>Thu Sep 21</b>	Top-down Parsing	2.3	List comprehensions	5.1-5.3	HW3 HW2
8	<b>Tue Sep 26</b>	Context-Free Grammars		List comprehensions	5.4-5.6	
9	<b>Thu Sep 28</b>	Bottom-up Parsing		Recursion	6.1-6.2	HW4 HW3
10	<b>Tue Oct 03</b>	Lex & Yacc		Recursion	6.3-6.6	
11	<b>Thu Oct 05</b>	Automata Theory	2.4	Higher-order functions	7.1-7.2	HW5 HW4
12	<b>Tue Oct 10</b>	Names, Scopes & Bindings	3.1-3.5	Higher-order functions	7.3-7.5	
13	<b>Thu Oct 12</b>	Stack Frames	9.1-9.2	<i>Haskell Quiz 1</i>		HW6 HW5
14	<b>Tue Oct 17</b>	Closures & Lambdas	3.6	Higher-order functions	7.6-7.7	
15	<b>Thu Oct 19</b>	Semantics	4.1	Types and classes	8.1-8.3	HW7 HW6
16	<b>Tue Oct 24</b>	Attribute Grammars	4.2-4.4	Types and classes	8.4-8.6	
17	<b>Thu Oct 26</b>	Attribute Grammars		<i>Haskell Quiz 2</i>		HW8 HW7
18	<b>Tue Oct 31</b>	<i>Midterm Exam</i>				
19	<b>Thu Nov 02</b>	Control Flow	6.1-6.6	Haskell Input & Output	10.-10.5	HW9 HW8
20	<b>Tue Nov 07</b>	Type Systems	7.1-7.2	Monads	12.1 - 12.3	
21	<b>Thu Nov 09</b>	Type Systems	7.3	Monads		HW10 HW9
22	<b>Tue Nov 14</b>	Parameter Passing	9.3	Monads		
23	<b>Thu Nov 16</b>	Exception Handling	9.4	<i>Haskell Quiz 3</i>		HW11 HW10
24	<b>Tue Nov 21</b>	Object-oriented Programming	10.1-10.4	Foldables & Traversables		
	<b>Thu Nov 23</b>	<i>Thanksgiving break</i>				
25	<b>Tue Nov 28</b>	Object-oriented Programming	10.5-10.7	Foldables & Traversables		
26	<b>Thu Nov 30</b>	Concurrency	13.1-13.4	Lazy Evaluation	15.1-15.4	HW12 HW11
27	<b>Tue Dec 05</b>	C++ & OpenMP		Lazy Evaluation	15.5-15.7	
28	<b>Thu Dec 07</b>	Java Threads		<i>Haskell Quiz 4</i>		HW12
29	<b>Tue Dec 12</b>	Review				
	<b>Tue Dec 19</b>	<b>10:30am - 12:30pm Final Exam</b>				