

Data Structures  
CMSC 341 Sect 04  
Spring 2019

**Professor:** Dr. David Chapman    [dchapm2@umbc.edu](mailto:dchapm2@umbc.edu)  
**Blackboard:** [blackboard.umbc.edu](http://blackboard.umbc.edu)  
**Classroom:** Mo/Wed 1:00 – 2:15pm    Math / Psych 106  
**Office Hours (TA):** Mo 2pm-5pm Fri 11am-2pm    ITE 240  
**Office Hours (Prof):** Fri 2:00-4:00    ITE 337

**Multi-Section Website:** <https://userpages.umbc.edu/~cmarron/cs341.s19/>

## 1. Overview

The purpose of this course is to introduce students to the many ways in which computers can represent data. It is expected that by the end of this course, students will have a basic understanding of a wide variety of data structures, their advantages and disadvantages, including performance and memory tradeoffs for operations such as insertion, removal, and traversal. Students will also gain the technically challenging programming skills necessary to design, implement, and debug data-structures which are fundamental to the field and of great practical value as well.

## 2. Topics of Interest

We will introduce Data Structures with a diverse set of use cases, analyze their performance tradeoffs, and then implement the code. Topics of interest include Arrays, Stacks/Queues, Trees, Balanced Trees, Heaps, Hash Maps and Graphs. We will also introduce the topic of Asymptotic Complexity which will allow us to determine which Data Structure is best suited for a given purpose and why.

## 3. Required Textbook

M. Goodrich, R. Tamassia, D. Mount, “Data Structures & Algorithms in C++: Second Edition”, John Wiley & Sons, Inc. ISBN-13 978-0-470-38327-8

## 4. Grading

Project 0	3%	(3% total)
Project 1-5	7% each	(35% total)
Homework 1-6	2% each	(12% total)
Exam 1 & 2	15% each	(30% total)
Final Exam	20%	(20% total)
<b>Sum:</b>		<b>100%</b>

Grading Scale:    0 <= F < 60 <= D < 70 <= C < 80 <= B < 90 <= A <= 100

Individual assignments “*might*” be curved in your favor, but the final grade will not be curved. Assignment grades will be posted on blackboard.

## 5. Lecture Topics

The following is the projected schedule. Topics covered and/or homework dates are tentative. However, Midterm Exam, Final Exam and Project Dates will not change.

	Date	Topic	Chapter	Hw Due	Project Due
Week 1	Jan 28 Jan 30	Arrays and Lists	3		
Week 2	Feb 04 Feb 06	Asymptotic Analysis	4, 6.1		
Week 3	Feb 11 Feb 13	Stacks and Queues	5	Hw 1 02/11	← Proj 0 (02/08)
Week 4	Feb 18 Feb 20	Binary Trees	7, 10.1		← Proj 1 (02/19)
Week 5	Feb 25 Feb 27	Induction	4		
Week 6	Mar 04 Mar 06	AVL Trees	10.2	<b>Hw 2 03/04</b>	← Proj 2 (03/05)
Week 7	Mar 11 Mar 13	Review <b>Midterm Exam 1</b>		Hw 3 03/11	
Week 8	Mar 18 Mar 20	Spring Break			
Week 9	Mar 25 Mar 27	Heaps	8		
Week 10	Apr 01 Apr 03	Hash Tables	9.1, 9.2	Hw 4 04/01	
Week 11	Apr 08 Apr 10	Maps	9.3 – 9.5		← Proj 3 (04/09)
Week 12	Apr 15 Apr 17	Graphs	13.3.1	Hw 5 04/15	
Week 13	Apr 22 Apr 24	Bredth First Search	13.3.3		← Proj 4 (04/23)
Week 14	Apr 29 May 01	Review <b>Midterm Exam 2</b>		Hw 6 04/29	
Week 15	May 06 May 08				
Last Day	May 13	Review			← Proj 5 (04/14)

**Final Exam Wednesday May 22nd 1:00pm – 3:00pm in MP 106 (regular classroom)**

## 6. Projects

Project assignments and due dates are coordinated among all sections of CMSC 341. Projects are listed at the following URL of the shared course website:

URL: <https://userpages.umbc.edu/~cmarron/cs341.s19/projects/>

Projects must be written in C++ using g++ and compile with no warnings.

Please see the **Project Submission Page** as well as the **Project Late Policy** at URL for details.

Projects must be **submitted by 9:00pm on the due date** using /afs on UMBC's GL servers

Late projects will have deductions for each day late, and will not be accepted more than 3 days late.

Project 0 must be submitted on time, no late Proj 0 will be accepted.

## 7. Homeworks

In this section we will turn in **homeworks at the start of class** on paper/pencil.

All homework papers must be stapled or clipped.

With advanced notice, it is also acceptable to turn in homeworks (either typed or scanned) electronically to Prof. Chapman by email.

## 8. Exams

There will be two midterm exams and one final exam. Each midterm is worth 15% each and the final is worth 20%. Exams must be taken in class unless the student has prior written approval from the instructor. The instructor is unlikely to grant approval except due to illness or other dire circumstances.

## 9. Student Support Services

UMBC is committed to eliminating discriminatory obstacles that disadvantage students based on disability. Student Support Services (SSS) is the UMBC department designated to receive and maintain confidential filings of disability-related documentation, certify eligibility for services, determine reasonable accommodations, develop with each student plans for the provision of such accommodations, and serve as a liaison between faculty members and students regarding disability-related issues. If you have a disability and want to request accommodations, contact SSS in the Math/Psych Bldg., Room 213 or at 410-455-2459. SSS will require you to provide appropriate documentation of disability. If you require special accommodations for this course, make an appointment with Dr. Chapman to further discuss SSS-approved accommodations

## **10. Academic Integrity**

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they will not be tolerated. Academic Misconduct could result in disciplinary action that may include, but is not limited to a grade of zero on the relevant assignment, failure of the entire course, suspension, or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the Faculty Handbook, or the UNBC Policies section of the UMBC Directory. Every student should read and fully understand the information given at <http://www.umbc.edu/integrity>

## **11. Just in Case: Mental Health and Well Being**

Diminished mental health can interfere with optimal academic performance. The source of symptoms might be related to your course work; if so, please speak with me. However, problems with other parts of your life can also contribute to decreased academic performance. UMBC provides cost-free and confidential mental health services through the Counseling Center to help you manage personal challenges that threaten your personal or academic well-being.

Remember, getting help is a smart and courageous thing to do – for yourself and for those who care about you. For more resources, get the Just in Case mental health resources Mobile and Web App. This app can be accessed by clicking <http://counseling.umbc.edu/justincase> The UMBC Counseling Center is in the Student Development & Success Center (between Chesapeake and Susquehanna Halls). Phone: 410-455-2472. Hours: Monday-Friday 8:30am-5:00pm.

## **12. Title IX / Sexual Misconduct**

UMBC does not discriminate against students, faculty or staff based on sex in any of its programs or activities, including but not limited to educational programs, employment, and admission. Sexual harassment, including sexual violence, is a kind of sex discrimination and is prohibited by Title IX and the University.

UMBC is committed to maintaining a campus environment that is free from discrimination based on sex, and maintains that commitment by responding promptly and effectively when it learns of any form of possible discrimination based on sex. The University responds to reports of sexual harassment, including sexual violence, as part of its efforts to stop the harassment and prevent the recurrence of possible discrimination. In compliance with Title IX, the University has Sexual Misconduct and Sexual Harassment policies.

## **13. Inclement Weather**

Please check UMBC's home page to obtain the most reliable information about campus closures. Unless UMBC is closed, the classes will be held at their scheduled times. Time assignments and projects are due at their designated dates regardless of any campus closure. Midterm exams will be rescheduled in the event of campus closure.