Information Systems Department

University of Maryland Baltimore County

Baltimore, Maryland. 21250

Departmental Office: Room ITE 404, Phone: 410-455-3206

Synchronous Online
IS 247 Computer Programming II
Fall 2020

Instructor: Dr. Jennifer Carter
Phone: 443-516-7202
E-mail: jcarter@umbc.edu
Course Delivery Site http://blackboard.umbc.edu
Office Hours: Virtual office hours are currently by appointment, drop-in office hours will be available shortly after the start of the semester. It is easy to sign up for appointments, just access my calendar using the appointment page in the instructor information section of BlackBoard.

Teaching assistants:
Chhaya Kulkarni <ckulkar1@umbc.edu>
Naima Khan <nkhan4@umbc.edu>

Meeting Times: Lecture: Wednesday 8:30 - 9:45am

Textbook: The text is Introduction to Java Programming and Data Structures, tenth edition, by Y. Daniel Liang. Access to this text is provided with the REVEL access card for Java that was required for IS147. Lecture slides and other materials will be available on Blackboard. Additional references used will have links or content provided on BlackBoard, one example is the Java API reference at: http://docs.oracle.com/javase/8/docs/api/.

Course Description and Rationale: This second course in a sequence continues the development of programming and problem-solving skills, focusing on topics such as: lists, searching and sorting, sets, stacks, queues, trees and an introduction to analyses of algorithm time and space requirements.

Where does this course fit into the curriculum? This is the second of two Java courses. In addition to providing students with some depth in one programming language, this course introduces data structures used to organize information for analysis and processing. Concepts discussed in this course are relevant to many languages and information systems, e.g., graphs, hashing, lists, tables, trees. Basic understanding of programming, data structures and information systems is essential to a wide variety of career fields.

Prerequisites: IS 147 and MATH 155, or equivalents. Each student should have previously taken at least a semester of Java programming and be comfortable with Java programming and basic mathematics.

Course Objectives: The primary course objectives are;

- Advanced understanding of object-oriented programming and Java.
- Understand the basic concepts of data structures and related algorithms.
- Practice designing, implementing, and testing programs that apply abstract data structures.
- Write clear, understandable, efficient, and re-usable code.
- Be familiar with specific advanced data structures such as stacks, lists, balanced search trees, hash tables, priority queues and the set/map data structures.
- Gain an understanding of different ways of organizing data within a computer's memory and the contexts under which one data structure might be preferable to another.

Note that this course requires a lot of hands-on programming, design, analysis, and critical thinking.

Instructional Methods: This course is a synchronous online course. This means that students are expected to virtually attend their scheduled lecture and discussion sections. The direct instruction portion of the lecture and discussion sections will be recorded and posted for students that miss a class. The last portion of the lecture and discussion sections will not be recorded to allow for student questions and answers.

Attendance and Participation: Regular and punctual attendance is expected of all students. In the case of absence due to emergency (illness, death in the family, accident), religious holiday, or participation in official College functions, it is the student's responsibility to confer with the instructor about the absence and missed course work. Students are expected to attend virtual lecture and discussion classes. Classes highlight key points, applications and provide hands-on exercises that are important for understanding course material. Absences often result in lower grades. If you are not able to come to the virtual class, make sure to catch up on any content you miss by reviewing the recording and other online content. Note that the lectures and discussions will be recorded up until the last 5-10 minutes during which students may ask questions that are not recorded. This will give students that do not wish themselves and/or their questions to be posted in a recording the opportunity for a comfortable Q&A environment.

Class Preparation and Student Success: All of the reading assignments should be completed before the class in which the material is to be discussed. Students should expect that for every 3 credit hour course they are devoting at least 9 additional hours preparing and studying course materials which are required or suggested. Students should contact the instructor for additional information about how to best achieve the goals and meet the academic expectations for this course. Additional support is available through university or department resources in order to guide students toward success.

Learning programming is a "hands-on" activity. In order to fully understand and be able to apply the concepts learned, you must spend a significant amount of time practicing coding. This includes analyzing sample code and completing the programming assignments yourself. All work submitted for this class must be your own, unless the assignment is designated as a group project. If you need support for your individual assignment, you should make use of the appropriate support resources. These resources include the instructor, teaching assistants, the IS Department's Java tutors, and tutoring services through the Academic Success Center. Students can make an appointment as needed, or schedule weekly appointments. More information on how to sign up for tutoring will be available in our online BlackBoard classroom.

Course Requirements:
Regular punctual attendance
Complete all the assigned readings
Regular individual hands-on practice
On-time weekly submission of quizzes
On-time submission of programming assignments
Prepare for and complete all synchronous exams
Actively participate in virtual and online class; including class exercises and online discussions

Grade Apportionment: The grades will be based upon the following:
1) 3 in-class exams worth 40% of your grade
2) 5 programming assignments worth 35% of your grade
3) Weekly quizzes worth 20% of your grade
4) Participation worth 5% of your grade
The overall numerical grade earned in each category will be the total number of assignment points earned divided by the number of possible points. In order to ensure fair and equitable grading, no individual extra credit assignments will be available. Letter grades will follow UMBC grading standards (see additional information in the Appendix): A from 90-100, B from 80-89 and C grades range from 70-79, D from 60-69 and F will be 59 and below.

Quizzes: Quizzes are provided online and correspond to the course readings. Quizzes are typically available for a week and due dates correspond to completion of the topic in class. Quizzes are auto-graded and will not be available after the due date. Make sure to plan ahead since quizzes may not be submitted late or made up. Questions are typically multiple choice and true/false, but additional question types may be included.

Exams: There will be 3 exams that make up 40% of your course grade. Exams are taken online synchronously, meaning that all students will take the exam within the same time period. Exams emphasize data structure and programming concepts using Java programming. The exams will include both reading and writing code. In order to be fair to all students, the exam must be taken within the same time period for all students. The Respondus lockdown browser and webcam will be required and ID must be presented in order to take a test. Students should use the practice test well ahead of the scheduled exam to make sure their equipment and applications are working as required. Technical support is available through the UMBC Technical Support Center and through the link in our BlackBoard classroom. Students are responsible for content in the assigned readings, presentations, classroom discussions, class

exercises, programming assignments, and the course's Blackboard pages. Note that the exams are individual exams and any collaboration or any capturing or sharing of exam content is a violation of the academic integrity policy that will result in the issue being turned over to the Academic Conduct Committee.

Programming Assignments: Grading of programming assignments will be based on a provided rubric stressing completeness (as adherence to the specification), proper execution, efficiency, clarity, and simplicity. Unless specifically stated in the assignment, all programming assignments are individual assignments and must be completed independently. Appropriate support resources are the TA's, approved tutors, and the course instructor. Only original, unique student code may be submitted (see the academic integrity policy). SafeAssign will be enabled to ensure originality. Any assignments that are determined to be copied or duplicate code will result in a zero for that assignment and will be reported as an academic integrity violation. Program submissions must be executable, and include execution screenshots to validate proper execution of all required program functions. Students are expected to develop well-structured code meeting basic code standards. Assignments must be submitted on-time through Blackboard. In order to stay on schedule and be fair to all students, no late assignments will be accepted, unless coordinated and approved by the instructor prior to the due date (for example, with approved accommodations).

Participation: Participation is critical to being successful in this course. Your participation grade will include points for class exercises and online discussions. Class exercises provide hands-on practice that prepares you to do well on the exams and programming assignments. Class exercises must be turned in by the end of the synchronous class, or the allotted extra time that day after class (in case there is not enough time during class). No credit will be provided for late class exercises. Online discussions provide an opportunity for valuable engagement with your peers through posting code segments, comments and responses. Each class exercise and online discussion will be worth 1 point (at least 15 class exercises/discussions will be available). 10 points will provide full credit for class participation. Any points earned above 10 will be added as extra credit points to your total exam score at the end of the semester.

To ensure a positive and inclusive online environment, only informative, constructive and supportive postings/responses are acceptable. If you encounter any instances of inappropriate or uncomfortable engagement, please report it by email to the instructor as soon as possible. Unless otherwise stated, communication will be bounded to Blackboard messaging, WebEx and UMBC email.

Hands-on Practice: Practice problems are available in your textbook and/or with your REVEL access card. Practice problems and/or sample code may be provided within the online classroom to help build your skills for programming assignments or as study materials for the exam. Taking the initiative to develop code for practice problems and to analyze/execute/modify sample code is expected in order to be successful in this course.

Grading Standards: IS instructors are expected to have exams and evaluations, which result in a reasonable distribution of grades. With respect to final letter grades, the University's Undergraduate Catalogue states that, "A, indicates superior achievement; B, good performance; C, adequate performance; D, minimal performance; F, failure" There is specifically no mention

of any numerical scores associated with these letter grades. Consequently, there are no pre-defined numerical demarcations that determine final letter grades. These numerical demarcations that determine final letter grades can only be defined at the end of the semester after all numerical grades have been earned. At that point, numerical demarcations for final letter grades can be defined such that final letter grades in this course conform to the University's officially published definitions of the respective letter grades. In accordance with the published University grading policy, it is important to understand that final letter grades reflect academic achievement and not effort. While mistakes in the arithmetic computation of grades and grade recording errors will always be corrected, it is important to understand that in all other situations final letter grades are not negotiable and challenges to final letter grades are not entertained. Historical data suggest an "A" may be in the 91-100 range, "B"s may be from 81-90 and "C" grades range from 70-80.) All points from assignments and exams are additive for the semester. Each student starts at zero points which is an"F", any other grade must be earned. There will be no individual extra credit assignments available.

Due Dates: All programming assignments and quizzes are to be handed in by the due date.

Make-up Policy: No make-up exams, except through arrangement with the instructor prior to the exam date: and then for reasons deemed valid enough to warrant the making of a new, and potentially harder, test.

Technical Assistance: The Technology Support Center (TSC) is available to help you with any technical issues you have with accessing the virtual lectures, course materials, Blackboard, email, course software tools, etc. You can find their contact information on the website at https://doit.umbc.edu/tsc/ and by phone at 410-455-3838. You can also access technical support directly from the online classroom using the links "Chat with Bb support" and "Request Help". If you are having trouble during an exam, make sure to contact the Professor and call the Technical Support Center for immediate resolution within the exam time period.

Academic Integrity: Academic integrity is an important value at UMBC. 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 are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. These principles and policies apply in both face-to-face and online classes. Resources for students about academic integrity at UMBC are available at https://academicconduct.umbc.edu/resources-for-students/. UMBC Academic integrity standards apply to programming code. Students must turn in their own original code for all assignments. Any code, that is not the student's own original code, that is not referenced by or provided by the instructor as part of the assignment may not be used in student submissions. This includes code from other students, online code, or code from other textbooks. Students must submit their own original code. Instances of code plagiarism are required to be reported as academic integrity violations.

Inclement Weather: Since this is a synchronous online class, the classes will not be canceled due to inclement weather. Lecture and discussion recordings will be available.

COURSE SCHEDULE

Topic	Readings
Intro and Review	Chapters 1-9
Objects and Classes	Chapters 9 and 10
Inheritance and Polymorphism	Chapter 11
Exceptions and I/O	Chapter 12
Abstract Classes and Interfaces	Chapter 13
Recursion	Chapter 18
Generics	Chapter 19
Lists, stacks, queues, sets, maps	Chapters 20, 21, and 24
Sorting and searching	Chapter 22 and 23
Binary Search Trees	Chapter 25
Graphs	Chapters 28 and 29

APPENDIX

UMBC Policies and Resources for Students during COVID-19

UMBC's Vision Statement

Our UMBC community redefines excellence in higher education through an inclusive culture that connects innovative teaching and learning, research across disciplines, and civic engagement. We will advance knowledge, economic prosperity, and social justice by welcoming and inspiring inquisitive minds from all backgrounds.

Student Safety

In response to the COVID-19 pandemic, it is understood that some students who are enrolled in classes that have an in-person component may have or develop COVID-19 related health concerns coming to campus to attend those classes this semester. No student shall be compelled to attend class or attend an assessment if they have COVID-19 related health concerns. However, for students enrolled in courses having a physical presence component who anticipate not being able to attend the in-person class sessions due to COVID-19 related health concerns, it is advisable to provide notice to the course instructor at the beginning of the term so that alternate arrangements can be made. Students enrolled in courses with an in-person component who develop COVID-19 related health concerns during the semester should immediately contact the course instructor to discuss alternative instructional arrangements.

Technology: Access, Requirements, Resources, Support

To help ensure that UMBC students are equipped for academic success, the Division of Information Technology (DoIT) provides a wealth of resources and support, including tips for getting online and minimum specifications to consider when purchasing a computer (doit.umbc.edu/students). UMBC does require all students to be technologically self-sufficient, which entails having a reliable personal computer (preferably a laptop with webcam) and Internet access. Since UMBC requires all students to have a computer and Internet access, financial aid may be used to meet this requirement. To learn more, students should contact their financial aid counselor at financialaid.umbc.edu/contact.

COVID-19: Safety Expectations and Guidelines

Students enrolled in this course are expected to adhere to all UMBC policies, rules, and regulations, including COVID-19 emergency health and safety rules, policies, guidelines, and signage enacted for the UMBC community. For students attending in-person classes, signage, policies, rules, and/or guidelines may include but are not limited to specific requirements for face coverings, physical distancing, and sanitization, in addition to efforts to reduce density efforts that involve reductions in seating and room capacity. Please be aware that UMBC's COVID-19 emergency health and safety rules, regulations, policies, guidelines, and/or signage are subject to change as our public health crisis evolves. Any violation will be subject to disciplinary action and may include but not limited to immediate dismissal from the classroom, removal from the classroom and/or campus, a requirement to work remotely, and/or sanctions and conditions

enumerated in the UMBC Code of Student Conduct that may entail suspension or expulsion from UMBC.

Resources to Help you Succeed in Online Courses

Many students need additional support to succeed in online courses. Click on the following links for helpful resources:

UMBC's Academic Success Center (ASC) provides a range of resources to support students as they progress toward degree completion. They will continue to offer all of their services online.

The ASC has created a specialized set of **Online Learning Resources**, including videos and guides to help students succeed while learning online.

In addition, check out the following resources:

- **Academic Success Center Resources** include: Online tutoring and writing support, supplemental instruction/peer-assisted study sessions (SI PASS), placement testing, FYI academic alerts, success courses, academic advocacy, academic policy and academic success meetings.
- **Tutoring and Writing Center Appointments** will be online; students can make appointments using this link.
- **SI PASS** Supplemental Instruction (SI)/ *Peer Assisted Study Sessions* (PASS). The SI PASS program targets traditionally difficult academic courses, providing regularly scheduled, out-of-class review sessions, happening in Blackboard Collaborate inside your existing Blackboard course.
- **Academic Advocates:** Advocates work one-on-one with students who need support navigating academic and institutional challenges, no matter how complex the concerns (i.e., personal, academic, or financial).
- **Academic Success Meetings** - Schedule a one-to-one virtual meeting with an Academic Success Center Professional who can help you with time management, study skills, and accessing campus resources.

If you have a question, please contact the ASC at academicsuccess@umbc.edu

Enrollment Dates and Deadlines

Students must be familiar with the academic policies and enrollment dates and deadlines as published in the Undergraduate Catalog and the Academic Calendar. They are also responsible for managing their course enrollment(s) accordingly.

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 would create 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 for registration information and office procedures.

SDS email: disAbility@umbc.edu
SDS phone: (410) 455-2459

If you will be using SDS approved accommodations in this class, please contact me (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's Policy on Sexual Misconduct, Sexual Harassment and Gender Discrimination and Federal Title IX law prohibit discrimination and harassment on the basis of sex 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 retaliation should contact the University's Title IX Coordinator to make a report and/or access support and resources:

Mikhel A. Kushner, Title IX Coordinator (she/her/hers)
410-455-1250 (direct line), kushner@umbc.edu

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 or thinking about making a report, please see the Online Reporting Form. Please note that, while University options to respond may be limited, there is an anonymous reporting option via the online form and every effort will be made to address concerns reported anonymously.

Notice that Faculty are Responsible Employees with Mandatory Reporting Obligations:

All faculty members are considered Responsible Employees, per UMBC's Policy on Sexual Misconduct, Sexual Harassment, and Gender Discrimination. Faculty are therefore required to report possible violations of the Policy to the Title IX Coordinator, even if a student discloses something they experienced before attending UMBC.

While faculty members want you to be able to share information related to your life experiences through discussion and written work, students should understand that faculty are required to report Sexual Misconduct to the Title IX Coordinator so that the University can inform students of their rights, resources and support.

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:

The Counseling Center: 410-455-2742 / After-Hours 410-455-3230

University Health Services: 410-455-2542

Pastoral Counseling via Interfaith Center: 410-455-3657; interfaith@umbc.edu

Other Resources:

Women's Center (for students of all genders): 410-455-2714; womenscenter@umbc.edu.

Shady Grove Student Resources, Maryland Resources, National Resources.

Child Abuse and Neglect:

Please note that Maryland law and UMBC policy require that I report all disclosures or suspicions of child abuse or neglect to the Department of Social Services and/or the police.

Pregnancy

UMBC's Policy on Sexual Misconduct, Sexual Harassment and Gender Discriminationexpressly prohibits all forms of Discrimination and Harassment on the basis of sex, including pregnancy. Resources for pregnant students are available through the University's Office of Equity and Inclusion. Pregnant and parenting students are encouraged to contact the Title IX Coordinator to discuss plans and assure ongoing access to their academic program with respect to a leave of absence or return following leave related to pregnancy, delivery, or the early months of parenting.

In addition, students who are pregnant may be entitled to accommodations under the ADA through the Student Disability Service Office, and/or under Title IX through the Office of Equity and Inclusion.

Religious Observances & Accommodations

UMBC Policy provides that students should not be penalized because of observances of their religious beliefs, students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the responsibility of the student to inform the instructor of any intended absences for religious observances in advance, and as early as possible. For questions or guidance or to request an accommodation, please contact the Office of Equity and Inclusion at oei@umbc.edu.

Hate, Bias, Discrimination and Harassment

UMBC values safety, cultural and ethnic diversity, social responsibility, lifelong learning, equity, and civic engagement.

Consistent with these principles, UMBC Policy prohibits discrimination and harassment in its educational programs and activities or with respect to employment terms and conditions based on race, creed, color, religion, sex, gender, pregnancy, ancestry, age, gender identity or

expression, national origin, veterans status, marital status, sexual orientation, physical or mental disability, or genetic information.

Students (and faculty and staff) who experience discrimination, harassment, hate or bias or who have such matters reported to them should use the online reporting form to report discrimination, hate or bias incidents; reporting may be anonymous.