COURSE SYLLABUS
Spring 2021
January 19 – May 07, 2021
Internet - Online
Data Structures
CS22203-70
Computer Science

Instructor:	**Alan Cook**
Phone/Text:	775-538-2526 Mobile
E-mail:	acook@rio.edu
Office:	Bob Evans Farm Hall – Room 230

Office Hours: *Please schedule an appointment online:* 2526.us/meet
  at least 8 hours in advance to ensure availability

T/R @BEF230	09:00-10:00a *[schedule in advance at 2526.us/meet]*
T/R @Meigs Ctr.	03:45p-04:15p
T/R via MS Teams or phone	01:30-02:30p *[schedule in advance at 2526.us/meet]*

Dept. Secretary: 740-245-7373   Office Fax: 740-245-7110
McArthur Ctr. 740-645-7993   Meigs Center: 740-992-1880   Jackson Ctr.   740-288-0284

COURSE DESCRIPTION: This course builds on the concepts introduced in CS 20104 and CS 20204 Computer Programming I & II with emphasis on algorithms design and analysis, object-oriented design, data structures, and software engineering. Data structure topics include stacks, queues, hashing, linked lists, trees, and graphs.

PREREQUISITES: CS 20203 and MTH 14505

CREDIT HOURS: 3 credit hours

TEXTBOOK AND OTHER REQUIRED MATERIALS:
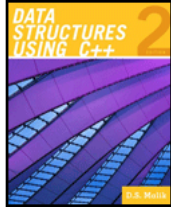
REQUIRED: Data Structures Using C++

Author:	**Malik, D.S.**
ISBN-13:	**978-0-324-78201-1**
ISBN-10:	**0-324-78201-2**
Edition/Copyright:	**2ND 10**
Publisher:	**Course Technology, Inc.**

Optional eBook available through Cengage
(may also available with purchase of "Cengage Unlimited")

Feel free to obtain any other materials that will help you learn the topics.

Software: Various open-source products

Access to Rio's Blackboard Learning Management System:
http://rio.blackboard.com

MindTap system requirements: www.tinyurl.com/mindtap-faq
[e.g., screen resolution must be 1024x768 or larger]

Face-to-Face Students Only:
Flash drive (2GB, or larger) for use with campus computers
Headphones/earphones for online training during classroom time

PROGRAM OUTCOMES: The following outcomes have been adopted for the degree program for which this course is required:

1. Students will use critical thinking and logic skills to formulate and solve problems related to programming and software development.
2. Students will be able to write code in a common programming languages such as Java, C, or Python.
3. Students will be able to explain ethical behavior as it relates to programming and operating computers.
4. Students will be able to Explain fundamental concepts relating to computer operating systems, software, hardware, and architecture.
5. Analyze, design, develop software projects and web applications. The student should be able to explain the different aspects of the software life cycle.
6. Analyze, design, develop, and administer a database system.

COURSE OUTCOMES: The following outcomes have been adopted for this course. *All outcomes* listed below have direct relevance to course material. Upon completion of this course students are expected to:

1. Understand advanced data structures in an Object-Oriented programming language
2. Develop efficient algorithms

3. Measure algorithm efficiency
4. Understand Abstract Data Types (ADT)
5. Understand recursion and develop recursive methods
6. Understand and implement data collections
7. Understand and write common structures such as: stacks, queues, linked lists, and trees
8. Use common data structures to solve complicated problems
9. Understand sorting and searching
10. Understand Hashing techniques

TOPICAL/CLASS OUTLINE:

DATE	Reading	Assignments
W1 1/19	*Univ Closed: Monday 1/18* Review syllabus, BB Appendix G: C++ for Java Programmers	Follow Blackboard/MindTap for list of assignments
W2 1/27	Unit 1: Principles and C++ Classes Udacity C++ Course	
W3 2/1	Unit 2: OOD and C++ Finish Udacity C++ Course	
W4 2/8	Unit 3: Pointers and Array-based Lists	
W5 2/16	*Univ Closed: Monday 2/15* Unit 4: Standard Template Library (STL) I	
W6 2/22	Unit 5: Linked Lists	
W7 3/1	Unit 6: Recursion	
W8 3/8	*MidTerm Week* Unit 7: Stacks *Special Topics*	
W9 3/15	Unit 8: Queues	
W10 3/22	Unit 9: Searching and Hashing Algorithms	
W11		

3/29	Unit 10: Sorting Algorithms *Univ Closed: Friday*	
W12 4/5	Unit 11: Binary Trees and B-Trees	
W13 4/12	Unit 12: Graphs	
W14 4/19	Unit 13: Standard Template Library (STL) II	
W15 4/25	*Review - Special Topics*	All work must be submitted by Friday Noon
W16	Finals Week Finish Final Projects	Final Projects Due by Thursday midnight

GRADING POLICIES/TESTING/ASSIGNMENTS/ATTENDANCE/EXPECTATIONS

Grade calculation	% of Grade	Grading Scale		
Participation	10%	A	=	93 – 100%
Chapter Exercises	15%	A-	=	90 – 92%
End of Chapter Exercises	20%	B+	=	87 – 89%
Chapter Quizzes	25%	B	=	83 – 86%
Activities	20%	B-	=	80 – 82%
Final	10%	C+	=	77 – 79%
TOTAL	=100	C	=	73 – 76%
		C-	=	70 – 72%
		D+	=	67 – 69%
		D	=	63 – 66%
		D-	=	60 – 62%
		F	<	60%

Midterm: The midterm grade is only an indicator of progress in the course and will be calculated by either an average of the quiz scores (or, alternatively, assessing the work that should be completed at the conclusion of the first half of the course).

Exams: Exams for each unit are online through the Blackboard course.

Assignments: Students should follow the syllabus and Blackboard to keep up with weekly assignments (late work may not be accepted or may result in a loss of points/percentage).

Participation: Classroom participation for face-to-face classes may be graded on classroom activities while online student participation may be graded on completion of online assignments. Face-to-face activities may be required to be completed at the conclusion of the class time. Online students may be required to complete activities as indicated on Blackboard for weekly participation.

Failure to attend the face-to-face course and/or log into Blackboard during the beginning of the online course may result in a student being reported for non-attendance.

Face-to-Face Lab Behavior: Phones should be set to vibrate or silent to allow students to receive emergency notifications without disruption of the classroom. Devices such as laptops, smartphones, Internet-connected devices and university provided computers should be used ONLY to enhance the course (such as looking up information for discussion/in-class activities, etc.) and NOT become a distraction to the learner or other students in the classroom (texting, etc.). Headphones/earphones (even just in one ear) or non-religious/unapproved headgear (hats or hoods, etc.) that cover ears should not be used/worn during classroom instructional activity time. Students should be aware of and respect posted policies in lab classrooms, such as "no food and drinks". Students who are not engaged in the face-to-face classroom may forfeit participation points.

We are Rio. Learning, living, and working in the community are vital to our Mission at URG/RGCC. The COVID-19 pandemic and the risks posed to our community and the world require that each of us observe heightened well-being and safety measures in the coming academic year. Your safety, health, and well-being, as well as that of our faculty, staff, and guests to campus are our primary concern, and we want to support you in any way that we can. We have expectations

that you act responsibly in order to mitigate risk to others. We cannot fully eliminate risk—no one can; however, we can and should mitigate risk. Keep in mind that wearing masks on campus is mandated and that social distancing should be maintained.

Email Communication: To avoid messages from being filtered/not delivered, all student and faculty communication should be restricted to official university supplied email addresses. If you need a call back, please include a phone number in your email message. Email messages should always be professional and include your full name and course information (course and section #).

Incomplete Grades: Student must meet the requirements for an incomplete grade and submit a completed application (available from the registrar) for an incomplete grade, including an explanation for the request and documentation. The university charges a fee for incomplete grades. The application should be submitted to the instructor before the beginning of finals week.

Course Survey: Student are expected to complete a course evaluation survey before the end of the semester through the online evaluation system. Course survey information is requested before the end of the semester, but survey results are withheld from instructors until after grades have been submitted. Course evaluations are necessary for the school's accreditation and assist with the institutional assessment and future planning.

ACADEMIC SUPPORT SERVICES

ADA Accessibility Services: Students who wish to receive ADA reasonable accommodations due to a qualifying physical, mental, or learning disability, should to contact the Office of Accessibility to learn more about requesting accommodations as early in the term as possible. Those who are not certain whether a medical condition/disability qualifies for services may contact Stephanie Alexander, PhD, Director of Academic Support Services at: alexander@ rio.edu, or (740) 245-7366 for further information. The Office of Accessibilities is located in Rhodes Student Center and offers virtual, phone, and face to face appointments.

Tutoring Lab and Writing Assistance: The Jenkins Center offers free tutoring in many subjects as well as writing assistance to all Rio students. Services are offered in both virtual/online and face to face format. To schedule a tutoring appointment or to learn more about tutoring services, contact Kelsey Doughman, MEd (tutoring coordinator and professional math tutoring specialist) at student-success@rio.edu. To schedule a writing assistance appointment or to learn more about using the Jenkins Center "OPS" (online paper service), contact Adam Hollingshead, MA (professional writing specialist) at student-success@rio.edu.

ACADEMIC HONESTY & INTEGRITY: As educational institutions, the University of Rio Grande and Rio Grande Community College seek to nurture a high standard of academic honesty and integrity in students, faculty, and staff. All persons are expected to present and represent their own original work and to fully and properly credit sources of information used in the preparation of their own original work. Any person committing an act of plagiarism, cheating, attendance fraud, or other form of academic dishonesty is subject to the fullest measure of consequences, including course failure and suspension. Repeated violations will subject the student to automatic academic suspension with failing grades for not less than one academic year. Failing grades assigned because of academic dishonesty will not be eligible for forgiveness under the Academic Policy.

ADA POLICY: If a student wishes to be identified as having a physical, mental, or learning disability, that may or may not require reasonable accommodation(s), he/she must register with the Office of Accessibility. These registered students should identify themselves to their instructors and provide a written statement from the Accessibility Office that indicates the appropriate accommodations. The process of a student self-proclaiming the need for accommodation should occur as early in the semester as possible. The Office of Accessibility phone is 740-245-7439 and is located in Rhodes Hall, Room 118, University of Rio Grande.

MENTAL HEALTH SERVICES: As a student, you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce your ability to participate in daily activities. Services are available to assist you with addressing these and other concerns you may be experiencing. Contact the Office of Accessibility (740-245-7439) to learn more about the confidential mental health services available to you.

FERPA: The University of Rio Grande and Rio Grande Community College are committed to fully respecting and protecting the rights of students under the Family Educational Rights and Privacy Act (FERPA). These rights generally include the right to inspect, review and seek amendment to the student's education records and the right to provide written consent before personally identifiable information from education records is disclosed. Under FERPA, students have the right to file a complaint with the US Department of Education concerning alleged failures to comply with FERPA. Please see the Student Records Confidentiality/Rights Under FERPA section of the Student Handbook for details and more information.

COPYRIGHT: Materials used in association with this course may be copyright protected. These items are provided for educational purposes and are intended for the use by only those students officially enrolled in the course. Individuals may not copy, duplicate, download, or distribute any of these items outside this course without first considering United States copyright law (Title 17, US Code) and Rio Grande's copyright-related policies.

WITHDRAWAL: See the Student Handbook for withdrawal information and the current university course schedule for last day during the semester to withdraw from course.

** This syllabus is not to be construed as a contract with the student and may be subject to change**