



**CSCI3333.04: Algorithms and Data Structures
SYLLABUS
Fall 2021**

Subject to any new Texas legislative mandate changes.

COURSE INFORMATION:

Meeting times: MW, 11apm - 1215pm

Meeting location: BMAIN 1.508 and online through Bb Collaborate Ultra (accessible in Blackboard)

Course Modality: Hybrid/Reduced Seating Courses (REDUC)

INSTRUCTOR INFORMATION:

Instructor Name: Liyu Zhang

Phone: (956) 882-6631

E-Mail: liyu.zhang@utrgv.edu

Office hours and location:

- Monday: 10-12 and 4-5, online through Zoom meetings
- Tuesday: 10-11, online through Zoom meetings
- Wednesday: 10-12, in person at BSETB 1.522
- By appointment: online through Zoom meetings (preferred) or in-person at BSETB 1.522

COURSE DESCRIPTION, PREREQUISITES & MODE OF LEARNING

Course Description (Catalog) The course presents formal computation models. Topics include finite state machine, pushdown state machine, Turing machine, halting problem, definition and properties of formal grammars and their languages as well as theory of computability and complexity including the complexity of optimization and approximation problems.

Prerequisites You *must have a C or higher* in both CSCI/CMPE 2380 (Computer Science II) and CSCI3310 (Mathematical Foundation of Computer Science, used to be Discrete Data Structures). You must have the instructor's approval to take this course if you have not satisfied the prerequisites. In general, you are expected to have familiarity with advanced programming techniques, using principles of computer programming, as well as concepts including files, two-dimensional arrays, stacks, queues, linear and circular linked lists, tree data structures, and some sorting and searching methods.

Mode of Learning As stated in the previous section, this course will be delivered in hybrid mode. In particular,

- Lectures on Tuesday will be held online through Collaborate Ultra in Blackboard and lectures on Thursday will be held in person at BMAIN 1.508, the designated classroom. All lectures will be held at the scheduled class time, 11-1215, and be recorded through Panopto Media.
- All assignments including homework and projects will be posted online in Blackboard with links for submitting solutions.

Students are expected to

- Attend lectures in person, online through Collaborate Ultra, or by watching recordings in Panopto Media,
- complete each assignment and submit the solution in Blackboard, and
- take all exams in-person.

Specific instructions for taking the exams will be posted before the exams.

COVID-19 RESOURCES: Required on all syllabi. Do not modify.

Please visit the [UTRGV COVID-19 protocols web page](#) for the most up-to-date COVID-19 campus information and resources. The [COVID-19 Frequently Asked Questions \(FAQs\) web page](#) offers additional guidance to specific questions. To submit a question for the FAQ, please email [WelcomeBack@utrgv.edu](mailto>WelcomeBack@utrgv.edu).

UTRGV VACCINE PORTAL Required on all syllabi. Do not modify.

UTRGV Students are eligible to receive the COVID-19 Vaccine. Students may access and complete their vaccine profile via the [UTRGV Vaccine Portal](#). For additional information on the COVID-19 Vaccine, please visit the [UTRGV Vaccine web page](#).

LEARNING OBJECTIVES/OUTCOMES FOR THE COURSE

Program Student Learning Outcomes (evaluations of all outcomes are based on ABET standards)	Student Learning Outcomes (After completing this course, a student should be able to)	Major Course Requirement/Major Assignment/Examination
(1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.	<ul style="list-style-type: none"> • Understand basic data structures and abstract data types. • Gain an appreciation of the variety, theoretical nature, and practical uses of data structures. 	Homework and project assignments, and exams
(2) An ability to design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	<ul style="list-style-type: none"> • Select appropriate data structures for uses in computer programs. • Design and implement efficient algorithms based on the selected data structures. 	Homework and project assignments, and exams
(6) An ability to apply computer science theory and software development fundamentals to produce computing-based solutions.	<ul style="list-style-type: none"> • Understand the basic techniques of algorithm design and analysis. • Understand the basic concepts of computational complexity 	Homework and project assignments, and exams

TEXTBOOK, TECHNOLOGY, AND/OR RESOURCE MATERIAL

Textbook This course requires access to online learning material provided by zyBook. Please follow the instructions below to get access to the required material:

1. Sign in or create an account at learn.zybooks.com
2. Enter zyBook code: UTRGVCSCI3333ZhangFall2021
3. Subscribe

The URL for the online book is: <https://learn.zybooks.com/zybook/UTRGVCSCI3333ZhangFall2021>
The price for access to the above material is \$58.

Technology To succeed in this course, you need to be able to participate in class sessions and activities. This will require:

- Reliable internet for class meeting times
- A place to work and a reliable computer (laptop or desktop)
 - A tablet would be very difficult for this class, and insufficient for the major
 - Any standard computer will work. The most important considerations to compare against cost are:
 - Reliability, warranty, repair options
 - Portability, size, battery life
 - Desktops are more powerful and cheaper, but portability is a high value for most students. We have good open CS labs on campus, but that is not the same as having your own machine with you anywhere.
 - Windows is most common, and thus best supported. macOS and linux work, but you will need to have the IT knowledge and skills to adapt things (not in this class).
 - Specs:
 - Minimum: 8 GB RAM, i5 processor, 256 GB storage
 - Recommended: 16 GB RAM, i7 processor, 512 GB storage
 - SSD is very nice, but is also an easier cut to reduce cost
 - 2-in-1, touchscreen, pen digitizer are all great, but they are luxuries
 - You pay a premium for a mac or a surface, you can get equivalent hardware for a lot less
 - Big GPU power only matters if you are gaming or doing heavy 3d work. A secondary desktop later on may be a better investment.
 - Packages and deals are available [at the UTRGV bookstore \(https://link.utrgv.edu/campusstores-tech/\)](https://link.utrgv.edu/campusstores-tech/).

Resource material and daily access to online Blackboard We will use UTRGV online Blackboard as the place for making announcements and posting course materials/information such as course calendar, lecture notes, assignments and grades etc. So please check Blackboard regularly and at least once every 24 hours. It is your responsibility to keep updated with class through online Blackboard.

GRADING POLICIES

Attendance	10%
zyBook Reading	10%
Assignments (Homework and projects)	30%
Exams (Midterm and Final)	50%

Grading scale: 100% >= A >= 90% > B >= 80% > C >= 70% > D >= 60% > F

Re-grading If you have a question about the grading of any piece of work, you should consult with the instructor of the course within one week of the date that the work was returned. In other words, if you do not pick up your work in a timely fashion, you may forfeit your right to question the grading of your work.

EXAMS AND ASSIGNMENTS

Exams There is one mid-term exam during the semester, which will be held in regular lecture time on **Thursday, October 14th, 2021**. There is also a final exam at the end of the semester at the time and location as scheduled by UTRGV. Both exams will be based on materials covered in lectures and assignments. Please do not plan to travel at the end of semester until the final exam is over.

Assignments There will be three types of assignments in this course: reading the zyBook material, homework exercises and programming projects. Reading assignments requires you to read the assigned sections and complete all participation activities in those sections by the deadlines posted in Blackboard. Homework exercises are short-answer or essay problems that will help you practice and learn the theoretical aspects of algorithms including writing formal algorithm descriptions in pseudo-programming languages, and providing proofs of correctness and mathematical complexity analysis. Programming projects will help you practice and learn advanced programming using moderate to complex algorithms and data structures. Learning both aspects of the algorithms can be achieved only through working at their respective assignment problems. Therefore, it is very important for you to do each assignment seriously. All types of assignment problems will be given on a weekly/bi-weekly basis throughout the semester. Please note the following assignment submission requirements:

- Homework assignments: Typed submissions are recommended although scanned handwritten solutions are acceptable as long as they're written clearly and completely readable. The instructor cannot grade your solutions if they're unreadable. You must write/type clearly your name, student ID number and due date on the first page of your solution.
- Project assignments: You should compress all files in your project submission into one file (i.e., .zip, .rar, etc) and submit the compressed file through the submission link for the project provided in Blackboard. No programming assignment will be graded if the submitted program does not run.

No more than two assignment submissions that are late or do not meet submission requirements as described above will be accepted for each student. In addition, no assignment submissions will be accepted regardless if the solutions to those assignments have been already posted or given in class, or if a majority of the submitted solutions have been graded and returned to students. All submitted assignments, homework exercises and programming projects, are subject to oral defenses, where students are required to explain to the instructor key steps and details of the submitted assignment solutions satisfactorily and demonstrate complete understanding of the submitted work. Unsatisfactory assignment defenses might lead to grades of relevant assignment problems or whole assignments voided at the instructor's discretion.

ATTENDANCE

Students are expected to attend all scheduled lectures in one of the three ways:

- Attending the lecture in-person,
- Attending the lecture online through Collaborate Ultra in Blackboard, or
- Watching the recordings of the lectures in Panopto Media.

Attendance of each lecture will be recorded through a signing sheet, Collaborate Ultra participation reports, or Panopto viewing reports depending how you attend the lecture. Please note that in order to receive attendance credit for a lecture you must stay through the whole duration of the in-person lecture or the Collaborate Ultra session if the lecture is held online, or watch the lecture recording for its full length by Saturday of the same week the recordings made available. Attendance counts towards your final grade for this course by default. No excuse other than officially documented cases allowable by the university policies, which are usually only for family or extreme health emergencies, will be accepted for absences. You are not required to attend class on days listed in the university calendar as major religious holy days (although I assume that you practice at most one religion). In addition, you're allowed two absences without excuses or grade penalties. Students have the option to be exempted from attendance of lectures, in which case the percentage weight of attendance will be distributed proportionally among other grading components. To activate this option, however, students must notify the instructor no later than **Tuesday, September 7th, 2021**.

Students not exempted from attendance of lectures may be dropped from the course for excessive absences. UTRGV's attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; have been provided such an accommodation by Student Accessibility Services (SAS); for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

MAKEUP POLICIES

I generally don't give makeup assignments except officially documented cases allowable by the university policies, which are usually only for family or extreme health emergencies. If you need a makeup work you must notify me ahead of time, or as soon as reasonably possible.

BLACKBOARD SUPPORT

If you need assistance with course technology at any time, please contact the [Center for Online Learning and Teaching Technology](#) (COLTT).

Campus:	Brownsville	Edinburg
Location:	Casa Bella (BCASA) 613	Education Complex (EEDUC) 2.202
Phone:	956-882-6792	956-665-5327

Toll Free: 1-866-654-4555

Office Hours: Monday - Friday, 7:30 a.m. - 6:00 p.m.

Support Tickets Submit a Support Case via our [Ask COLTT Portal](#)

24/7 Blackboard Support

Need Blackboard assistance after hours? You can call our main office numbers, 956-882-6792 or 956-665-5327, to speak with a support representative.

USE OF LECTURE RECORDINGS

The instructor will record all lectures and make them available to all students in this course. This will enable you to have access to class lectures, group discussions, etc. in the event you have to miss a synchronous class

meeting due to illness or other extenuating circumstance. Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA), UTRGV's acceptable-use policy, and UTRGV HOP Policy STU 02-100 Student Conduct and Discipline. A recording of class sessions will be kept and stored by UTRGV, in accordance with FERPA and UTRGV policies. Your instructor will not share the recordings of your class activities outside of course participants, which include your fellow students, teaching assistants, or graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. **You may not share recordings outside of this course.** Doing so may result in disciplinary action under UTRGV HOP Policy STU 02-100 Student Conduct and Discipline.

ACADEMIC INTEGRITY

Members of the UTRGV community uphold the [Vaquero Honor Code](#)'s shared values of honesty, integrity and mutual respect in our interactions and relationships. In this regard, academic integrity is fundamental in our actions, as any act of dishonesty conflicts as much with academic achievement as with the values of honesty and integrity. Violations of academic integrity include, but are not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts (Board of Regents Rules and Regulations, STU 02-100, and UTRGV Academic Integrity Guidelines). **All violations of Academic Integrity will be reported to Student Rights and Responsibilities through [Vaqueros Report It](#).**

Specifically for this course, a grade of 0 will be given to the cheated work if a cheating is caught for the first time for the involved student, and an F grade will be given for the whole course to any student who is caught for cheating for the second time. In the latter case the incident will be forwarded to the department chair and beyond if necessary.

INCOMPLETES AND COURSE WITHDRAWAL

I will not give incomplete grades except for the rare cases dictated by the University and Department policy. It is the student's responsibility, not the instructor's, to withdraw from the course in a timely manner if doing poorly. No incomplete grades will be granted because of a wrong withdrawal process. Please obtain due dates to withdraw from the course and also please read and be aware of the formal procedures to withdraw. This information is available in the course schedule and the student affairs office.

UTRGV POLICY STATEMENTS

STUDENTS WITH DISABILITIES:

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive reasonable academic accommodations should contact **Student Accessibility Services (SAS)** for additional information. In order for accommodation requests to be considered for approval, the student must apply using the *mySAS* portal located at www.utrgv.edu/mySAS and is responsible for providing sufficient documentation of the disability to SAS. Students are required to participate in an interactive discussion, or an intake appointment, with SAS staff. Accommodations may be requested at any time but are not retroactive, meaning they are valid once approved by SAS. Please contact SAS early in the semester/module for guidance. Students who experience a broken bone, severe injury, or undergo surgery may also be eligible for temporary accommodations.

Pregnancy, Pregnancy-related, and Parenting Accommodations

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to apply to **Student Accessibility Services** using the following link: [Pregnancy Accommodations Request Form](https://www.utrgv.edu/pregnancy)
<https://www.utrgv.edu/pregnancy>

Student Accessibility Services:

Brownsville Campus: Student Accessibility Services is located in 1.107 in the Music and Learning Center building (BMSLC) and can be contacted by phone at (956) 882-7374 or via email at ability@utrgv.edu.

Edinburg Campus: Student Accessibility Services is located in 108 University Center (EUCTR) and can be contacted by phone at (956) 665-7005 or via email at ability@utrgv.edu.

MANDATORY COURSE EVALUATION PERIOD:

Students are encouraged to complete an ONLINE evaluation of this course, accessed through your UTRGV account (<http://my.utrgv.edu>); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available on or about:

Fall Module 1 (7 weeks)	October 6-12, 2021
Fall Regular Term 2021	November 12- December 1, 2021
Fall Module 2 (7 weeks)	December 1-7, 2021

SEXUAL MISCONDUCT and MANDATORY REPORTING:

In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report to the Office of Institutional Equity & Diversity (OIED@utrgv.edu) any instance, occurring during a student’s time in college, of sexual misconduct, which includes sexual assault, stalking, dating violence, domestic violence, and sexual harassment, about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like confidential assistance, or have questions, they can contact OVAVP (Office for Victim Advocacy & Violence Prevention) at (956) 665-8287, (956) 882-8282, or OVAVP@utrgv.edu.

STUDENT SERVICES

Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Student Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (956) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor’s office hours. University Resources include the Advising Center, Career Center, Counseling Center, Learning Center, and Writing Center. The centers provide services such as tutoring, writing help, counseling services, critical thinking, study skills, degree planning, and student employment. In addition, services such as the Food Pantry are also provided. Locations are listed below.

Center Name	Brownsville Campus	Edinburg Campus
Advising Center AcademicAdvising@utrgv.edu	BMAIN 1.400 (956) 665-7120	EITTB 1.000 (956) 665-7120
Career Center CareerCenter@utrgv.edu	BINAB 1.105 (956) 882-5627	ESTAC 2.101 (956) 665-2243
Counseling Center Counseling@utrgv.edu Mental Health Counseling and Related Services List	BSTUN 2.10 (956) 882-3897	EUCTR 109 (956) 665-2574
Food Pantry FoodPantry@utrgv.edu	BCAVL 101 & 102 (956) 882-7126	EUCTR 114 (956) 665-3663
Learning Center LearningCenter@utrgv.edu	BMSLC 2.118 (956) 882-8208	ELCTR 100 (956) 665-2585
Writing Center WC@utrgv.edu	BLIBR 3.206 (956) 882-7065	ESTAC 3.119 (956) 665-2538

TENTATIVE CALENDAR OF ACTIVITIES:

Week Of	Lecture Topics	Homework and Exams
8/23/2021	Syllabus, Programming and Mathematics Review	Homework 1
8/30/2021	Introduction to Algorithms (Chapter 1)	Homework 2
9/6/2021	Searching and Algorithm Analysis (Chapter 2)	Homework 3
9/13/2021	Sorting, part I (Chapter 3)	Homework 4
9/20/2021	Sorting, part II (Chapter 3)	Homework 5
9/27/2021	Lists, Stacks and Queues (Chapter 4)	Homework 6
10/4/2021	Hash Tables (Chapter 5)	Homework 7
10/11/2021	Midterm Review	Midterm Exam
10/18/2021	Trees (Chapter 6)	Homework 8
10/25/2021	Heaps and Treaps (Chapter 8)	Homework 9
11/1/2021	Graph Algorithms, part I (Sections 9.1 - 9.4)	Homework 10
11/8/2021	Graph Algorithms, part II (Section 9.5 – 9.7)	Homework 11
11/15/2021	Graph Algorithms, part III (Section 9.8 - 9.10)	Homework 12
11/22/2021	Graph Algorithms, part IV (Section 9.11 – 9.13)	Homework 13
11/29/2021	Final Review	
12/6/2021	Final Exam	

IMPORTANT DATES

Please note the following important dates according to the academic calendar of UTRGV, which can be found at <https://my.utrgv.edu/home> at the bottom of the screen, *prior to login*.

August 23	First day of classes.
August 26	Last day to add a class or register for Fall 2021 classes.
November 10	Last day to drop a class or withdraw.
December 2	Study Day – NO classes
December 3-9	Final Exams
December 13	Grades Due at 3 p.m.

DEAN OF STUDENTS RESOURCES:

The Dean of Students office assists students when they experience a challenge with an administrative process, unexpected situation such as an illness, accident, or family situation, and aids in resolving complaints. Additionally, the office helps to advocate on behalf of students and inform students about their rights and responsibilities as well as serving as a resource and support for faculty and campus departments.

[Vaqueros Report It](#) allows students, staff and faculty a way to report concern about the well-being of a student, seek assistance in resolving a complaint, or report allegations of behaviors contrary to community standards or campus policies.

The Dean of Students can also be reached by emailing dos@utrgv.edu or visiting [Virtual Office hours](#) in which a representative is available Monday-Friday 9:00-11:00 a.m. and 1:00-4:00 p.m.

Disclaimer This syllabus does not contain all regulations that relate to students. Contents in the syllabus may be changed by the instructor with advanced notice and/or agreement with the students. Any change will be kept to a minimum.