

# TEXAS COLLEGE

## Division of Natural and computational sciences

### Course Syllabus COSC 2336 Data Structures



*College is a Historically Black College founded in 1894, by the Colored Methodist Episcopal Church, now the Christian Methodist Episcopal Church (CME). Our mission continues to embody the principles of the Christian Methodist Episcopal Church. The College shall prepare students with competencies in critical and creative thinking related to the knowledge, skills, and abilities as defined in areas of study. Additionally, the College shall provide an environment to inspire intellectual, spiritual, ethical, moral, and social development, which empowers graduates to engage in life-long learning, leadership, and service.*

#### **Teaching and Learning Methodology and Philosophy:**

The teaching and learning philosophy in this course is to expose students to a variety of concepts, ideas, and problem-solving strategies, which are developed and extended through reading, class discussion and interactive exploration. The course is intended to prepare students to work independently on advanced projects. Much of the learning is expected to take place through class exercises, students creating and delivering lessons which act as steppingstones to concept development and subsequent growth in computer science.

#### **Student Expectations:**

All students are expected to

- be involved in class discussions and explorations, both large and small group.
- attend all the classes and be on time.
  - complete all daily assignments, and projects in a timely manner.
  - take responsibility for learning certain basic skills and relationships.
  - take responsibility for seeking additional help as it is needed.
  - collaborate with each other and contribute to each other's learning
- follow the guidelines of Students Handbook about ethical behavior and plagiarism.

#### **COURSE STRUCTURE**

This course is conducted entirely hybrid, which means you will zoom-in for lectures twice a week. You will participate in the course using Texas College learning management system called JICS. Attendance will be taken during every zoom period.

All students taking this course must strictly adhere to the following guidelines:

1. Apart from doing your assignments, you must login to this course at least twice daily to know what is going on in the class.
2. Check your email every day and respond to emails relating to this course immediately.
3. Check the due date for assignment and turn in assignment before or on the due date.
4. No assignment will be accepted after the due date nor will it be reopened again.
5. Study all assigned readings
6. Participate on the online forum
7. Do the extra homework if you need it and then take your final exam

### **Weekly Class Activity**

Each week assignments will be posted on JICS. You need to complete all the assignments including quizzes and tests.

**METHODS OF EVALUATION:** Hands-on laboratory assignments, tests, quizzes and homework assignments will be conducted. Students will follow instructions to use the features in each application and complete hands-on laboratory assignments

### **COURSE DESCRIPTION**

COSC 2336– Data Structures (3 credit hours). A study of abstract data types, both static and dynamic storage structures and their implementations using arrays structures, lists, stacks, queues, tree structures, and sorting and searching techniques and how to implement them in a high-level language, how to analyze their effect on algorithm efficiency.

Specific topic coverage includes:

- Classes and Data Abstraction
- Inheritance and Composition
- Pointers
- Classes
- Overloading and Templates
- Exception Handling
- Recursion

- Linked Lists
- Stacks and Queues
- Binary Trees
- Graphs
- Standard Template Library

## **COURSE OBJECTIVES**

The goal of COSC 2336 is to guide students to develop the knowledge and skills to integrate technology throughout their professional teaching practice. Upon successful completion of this course, students should be able to do the following:

1. Implement and use linear data structures, including stacks, queues, lists
2. Implement and use search structures and algorithms including binary search, search trees, and hash tables.
3. Use and implement search data structures, including search trees and hash tables.
4. Use and implement priority queues.
5. Describe, explain, and use abstract data types including stacks, queues, lists, sets, and maps.
6. Implement those data types using both contiguous and linked representations. Contiguous representation mechanisms include arrays and hash tables. Linked representation mechanisms include singly and doubly linked lists and trees.
7. Implement a variety of algorithms for searching and sorting, including linear search, binary search, insertion sort, selection sort, merge sort, quicksort, and heap sort.
8. Read and write recursive algorithms.

## **TEXAS COLLEGE OUTCOMES FOR COMPUTER SCIENCE**

*COSC 3355* is aligned with the Texas College mission and ensures the following institutional objectives:

1. *Enhance communicative skills (oral and written)*
2. *Enhance critical thinking and technology skills*
3. *Enhance leadership abilities and spiritual awareness*
4. *Create opportunities for professional and post-graduate pathways*

## **Web Site**

Supplementary information for the course is available at JICS of the college. The Web site contains class notes, PowerPoint slides, class announcements, the course syllabus, test dates, and other information for the course. Announcements for quizzes, assignments and homework will be posted on the website. The website will be updated weekly, so please check often for announcements.

## **SOFTWARE AND SUPPLIES**

### **Software and Programs:**

1. Access to websites as referenced in class. Students attempting to gain access through cell phones, Mac books, or outdated equipment may experience difficulties with certain websites or videos. It is the student's responsibility to locate viable equipment.
2. Access to JICS online classroom. It is the student's responsibility to become familiar with the online classroom and related components.
3. Most documents in this course will be HTML or Word format. However, you will need the additional software (which can be downloaded free from the Internet): Adobe Reader, ZOOM, Windows Media Player, and Quicktime.
4. Web 2.0 tools will be available online without additional costs to students. Students should be prepared to back up files on their own Flash Drive. Work should be saved more than once, as it is not the instructor's responsibility if technology issues suddenly occur and information is lost.

## **REQUIRED MATERIALS FOR THIS COURSE**

Students should have access to a computer with Microsoft Visual C++ and with access to the Internet. Students must download a copy of the C++ software and install into their device.

## **COURSE POLICIES AND PROCEDURES**

*COSC 2336 is an online course delivered through the JICS/E-Racer learning platform. Prerequisite skills include a working knowledge of computer skills, as well as of basic applications software. Email and web skills are also essential. Microsoft Office programs and tutorials are provided for free in JICS in the "Technology Help" tab.*

## **SUBMISSION OF ASSIGNMENTS**

*All assignments must be submitted on time in JICS. **Please do not submit work through emails.** Each day that an assignment is late, points will be deducted from the final grade of that assignment. In the event **extenuating circumstances** prevent you from turning in an assignment*

*please contact the instructor **before** the due date. Late work will be accepted without penalties only if emergencies are documented or technology outages prevail.*

### **ATTENDANCE POLICY**

*Online participation is a requirement for a passing grade in this course. **Students are expected to post discussion comments twice each week for participation.** Respond to the weekly discussion question by each Sunday and reply to at least one classmate by Wednesday of each week. To receive credit for substantive participation, each posting should exceed 80 words in thoughtful, complete sentences. You will not receive credit for participation if you submit bullet points, texting language, slang, profanity, or plagiarized commentaries. Please be advised that poor online participation can be grounds for being administratively withdrawn from the course. Please check emails and classroom announcements daily to remain well-informed.*

---

### **ACADEMIC INTEGRITY**

Texas College believes that strength of character is as important as academic achievement; therefore, the College expects everyone in the academic community to maintain personal integrity in academic matters and not to contribute or condone the dishonesty of others. Scholastic dishonesty (which includes any form of plagiarism, cheating, falsification of records, and collusion with others to defraud) is improper and will not be tolerated. Texas College reserves the right to apply disciplinary actions to a student who has committed scholastic dishonesty.

### **REMEDATION PLAN**

Students who have difficulty with the course will have the opportunity to:

- Meet with the professor for one-on-one support through fact-to-face meetings, telephone sessions, or web conferencing.
- Revise unsatisfactory work until it is satisfactory within a 7- day time limit.

### **GRADING RUBRIC**

The weights of the grades are as follows:

Programming	30 %
Assignments	20%
Quizzes	20 %

Midterm Exam	15 %
Final Exam/Project	15 %
Total	100 %

Percentage Earned	Course Grade
90 – 100	A – Excellent
80 – 89	B – Above Average
70 – 79	C – Average
60– 69	D – Below Average
00 – 59	F – Failing

The above distribution may be adjusted slightly depending on how the course proceeds and how many assignments and tests/exams can be given.

### **DISABILITIES AND SPECIAL NEEDS**

Texas College provides equal opportunity to qualified disabled persons in accordance with the requirements of the American with Disabilities Act (ADA). This Act ensures that individuals with current disabling conditions are provided reasonable accommodations to enable them to enjoy the programs, activities, services, and employment opportunities offered by the College. Texas College adheres to this provision once a student/employee self identifies. Students may contact the Office of Academic Affairs for information/assistance at: [adasupport@texascollege.edu](mailto:adasupport@texascollege.edu) .

### **NOTICE OF NON-DISCRIMINATION**

Texas College does not discriminate in any employment practice, education program, or educational activity on the basis of race, color, religion, national origin, sex, age, disability, sexual orientation, or veteran status. The Vice President for Academic Affairs has been designated to handle student inquiries regarding non-discrimination policies. Contact information is: Texas College, Attn: Vice President for Academic Affairs, Office of Academic Affairs/Martin Hall 1st floor, 2404 North Grand Avenue, Tyler, Texas 75702.

## **WEEKLY COURSE SCHEDULE**

### Tentative Schedule

<b>Week</b>	<b>Topics</b>	<b>Chapter Readings</b>	<b>Exams</b>
<b>1</b>	Review – User Defined Functions	Chapter 6	
<b>2</b>	User defined Simple data Types	Chapter 7	
<b>3</b>	Arrays and Strings	Chapter 8	
<b>4</b>	Inheritance and Composition	Chapter 11	
<b>5</b>	Pointers, Classes, Virtual Functions, Abstract Classes, and Lists	Chapter 12	
<b>6</b>	Overloading and Templates	Chapter 13	
<b>7</b>	Exception Handling	Chapter 14	
<b>7</b>	Recursion	Chapter 15	
<b>7</b>	Review		Mid-term Exam
<b>7-8</b>	Linked Lists	Chapter 16	
<b>9-10</b>	Stacks and Queues	Chapter 17	
<b>11</b>	Searching and Sorting Algorithms	Chapter 18	
<b>12</b>	Binary Trees	Chapter 19	
<b>13</b>	Graphs	Chapter 20	
<b>14</b>	Standard Template Library (STL)	Chapter 21	
<b>15</b>	Review		Final Exam