



(CSCI 251) Data Structure (Summer 2020)

Fort Hays State University
College of Science, Technology, and Mathematics
Department of Computer Science
Professor Dr. Hieu Dinh Vu

1. COURSE INFORMATION

- Course Credit Hours: Three credit hours
- Course Prerequisites: CSCI 221, CSCI 241
- Meeting of Class: Online

2. INSTRUCTOR INFORMATION

- Instructor: Dr. Hieu D. Vu
- Office Location: Online
- Office Hours: T, Th: 9:30 a.m. – 10:30 a.m. Also, students can make an appointment by email
- Email Address: hdvu@fhsu.edu
- Phone Number: 469-776-4652
- Fax Number: 785-628-5816

3. TEXTBOOK AND COURSE MATERIALS

- Required online Textbook and Homework System

Data Structure Essentials at <https://zybooks.zyante.com/#/catalog>

Please provide the following instructions to your students. Copy into your syllabus, discussion board, etc.

Copy instructions to clipboard

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

FHSUCSCI251VuSummer2020

3. Subscribe

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A subscription is **\$77**. Students may begin subscribing on May 18, 2020 and the cutoff to subscribe is Jul 22, 2020. Subscriptions will last until Aug 07, 2020.

Introduces the basics of algorithms and data structures including sorting, runtime complexity, lists, stacks, queues, hash tables, trees, and graphs.

The course ID and subscribe information is posted on Blackboard Course Technology Requirement folder

4. COURSE DESCRIPTION

Data structures such as linked lists, stacks, queues, trees, maps, and graphs and their accompanying algorithms and their analysis. Prerequisite(s): CSCI 221, and CSCI 241.

5. COURSE OBJECTIVES

- Implement and apply the search/sort algorithms for arrays, such as linear search, binary search, insert sort, select sort, quick sort, and merge sort.
- Design, implement, and apply linear type data structures, such as single/double linked list, stack, and queue
- Design, implement, and apply tree type data structures, such as binary search tree, AVL tree, and heap
- Demonstrate concepts of graph
- Demonstrate algorithms related to graph, such as breadth/depth first search algorithm, Dijkstra's shortest path algorithm, and Bellman-Ford shortest path algorithm

6. TEACHING, LEARNING METHODS, & COURSE STRUCTURE

- Delivery Method
 - Read Zybook "Data Structure Essentials"
 - Watch video notes from Zybooks or YouTube
 - Do online Textbook/Homework at Zybooks
 - Do Activities designed by instructor on Blackboard
 - Participate class
 - Participate discussions on the discussion board on Blackboard
- Instructional Approach

Students should study the materials of each module in following steps



- Read the Project and Activity assignment for the module and get general ideas about the data structures that will be implemented or problems that will be solved.
 - Repeat the following steps for each section until finish the whole module
 - Read one section of the online textbook and finish all interactive exercises in that section of the textbook
 - Think what knowledge from this section can be applied to what problems in activity
 - Watch video notes that are embedded in this section or recommended from YouTube to improve the understanding.
 - Participate the face to face lectures in class
 - Begin to do the project and activity after finish half of the module text.
 - Finish reading the module textbook and do all exercises that are embedded in the textbook.
 - Finish and turn in the project and activity.
- **Course Structure**

The course is structured into 6 modules. Each module has different duration (include weekends). It is student's responsibility to finish each module within its timeline. The detailed structure and timeline is listed in Course Schedule section below.

7. COURSE SCHEDULE

*This schedule is tentative and might change during the semester depending on how the course evolves. Students will be notified of the changes through announcements at the Blackboard course site. If time is mentioned in the course, it refers to the Central Time Zone. All assignment due by **11:59 p.m.** of the last day of Module Duration*

Modules/Exams	Topics	Reading/Explore	Homework /Projects	Due Date
Module 0 06/01-06/12 (Overlap with Module 1)	Familiar with Blackboard and Zybooks	Blackboard and Zybooks Textbook and Embedded Questions	Register on Zybooks	06/05/2020
Module 1 01/21 – 02/07 (Overlap w M0)	Search and Sort Algorithms	Chapter 1 of Zybooks Textbook	Homework 1 Activity 1 Project 1	06/12/2020



Exam One 06/15/2020	Cover Module 1	Study Exam One Review Online		06/15/2020
Module 2 06/16 – 06/24	Lists, Queues, and Stacks	Chapter 2 of Zybooks Textbook	Homework 2 Project 2	06/24/2020
Module 3 06/25 – 06/29	Hash Tables	Chapter 3 of Zybooks Textbook	Homework 3 Activity 2 Project 3	06/29/2020
Exam Two 07/02/2020	Cover Module 2 and 3	Study Exam Two Review Online		07/02/2020
Module 4 07/03 – 07/11	Trees	Chapter 4 of Zybooks Textbook	Homework 4 Project 4	07/11/2020
Module 5 07/12 – 07/19	Graph	Chapter 8 of Zybooks Textbook	Homework 5 Activity 3 Project 5	07/19/2020
Exam Three 07/21/2020	Cover Module 4 and 5	Study Exam Three Review Online		07/21/2020
Final Exam 07/23/2020	Cover Module 1 – 5	Cover Module 1 – 5		07/23/2020

8. ASSESSMENT METHODS AND GRADING SCALE

- **HOMEWORKS (20%)**
There are many questions are embedded in the online Zybooks textbook. A student shall answer all the embedded questions as he/she reads through each chapter. The students can attempt each question as many times as they wish. The instance feedback will be provided after each attempt. The homework grade will be input to the blackboard after the module deadline is passed.
- **ACTIVITIES (15%)**
There are three comprehensive activities, one activity per unit exam. Each activity will ask student to solve several problems that are related to the data structure and/or algorithms covered in the unit exams. These activities will help students to prepare unit exams. A student must turn in his/her activity via blackboard on schedule. No late activity is acceptable.
- **PROJECTS (20%)**
There are five projects, one project per module. The project will ask the students to implement a data structure that are related to the material in that module or solve a



problem by using the data structure or algorithm that is addressed in the module. A student must turn in his (her) project on schedule via Blackboard. NO late projects are acceptable.

- **EXAMS (30%)**
There will three segment exams. For on campus students, all exams must be taken in class.
- **FINAL (15%)**
There will be a comprehensive final exam given at the last week of the semester. Final exam is **mandatory**. Whoever misses the final will automatically fail the course. The final exam also must be taken under the supervision of a proctor.
- **Grade Cut:**
90% or above: A; 80% to 89%: B; 70% to 79%: C; 60% to 69%: D; 59% or below: U
All grade cut are sharp. There will be NO curve for any individual.

Please notice that the **weighted average** will be used for course assessment. Your course percentage will be calculated using the following formula:

$$\text{Course Grade} = \frac{YPT}{500} \times 20\% + \frac{YAT}{300} \times 15\% + \frac{YHT}{500} \times 20\% + \frac{YET}{300} \times 30\% + \frac{YF}{100} \times 15\%$$

Where YPT stands for Your Project Total Points; YAT stands for Your Activity Total Points; YHT for Your Homework Total Points; YET for Your Exams Total Points; and YF for Your Final Exam Points

Please **DO NOT** simply using your course total points to divide by 1700 to get your course percentage since the points on different categories are weighted differently. Please refer the following table for unit points, total unit points, and weight for each assessment category.

Assessment Categories	Unit Points	Total Category Points	Weight
5 Embedded Homework	100	$100 \times 5 = 500$	20%
5 Projects	100	$100 \times 5 = 500$	20%
3 Activities	100	$100 \times 3 = 300$	15%
Three Exams	100	$100 \times 3 = 300$	30%
1 Final Exam	100	$100 \times 1 = 100$	15%
Total Points		1700	100%

9. STUDENT HELP RESOURCES



Students have access to academic services, technical support and student services at Fort Hays State University. You can find the resources on blackboard.

10. COURSE POLICIES

- **Class Attendance**
Students must do Homework, Activities, Projects, and Exams on time. Anyone who misses one homework, or one project, or one activity, or one exam will be reported to TigerIQ.
- **Assignment Due Date**
There no late Homework, project, activity, or exam is acceptable except with permission from instructor due to the emergency. In case there is an emergency needs to be accommodated, the student must send the instruction e-mail notification before the due date first then submit the evidence within two days.
- **Procedures for all Assignment Submission**
 - The online Homework is finished and submitted at Zybooks website. The Homework score will be recorded once the due date passes. The students still can continue to do the Homework. However, the score will not be updated.
 - The projects are suggested to finish with Java, however, the solution in C++ is also acceptable. No other language solutions are acceptable. The students may turn in all .java (or .cpp) files in a zip file by uploading it to Blackboard via project assignment link.
 - Exam has two parts. Part One is Multiple Choices/Fill in Blanks and Part Two is short answer. Both are given online with Lockdown Browser Monitor. Students need to download LockDown Browser. Students may do mock exam first to get familiar with Lockdown Browser Monitor.
- **Exam Make-ups**
Make-ups are possible if the student has reasonable excuse for unable to take the Exam on time. The instructor reserves the right to ask for evident documentation.
- **Activity/Homework/Project Due Date Notifications**
All the due dates are posted in course calendar. The instructor may also send e-mail to remind the students about the due date. However, it is the students' responsibility to ensure that all required materials are turned in on time

11. UNIVERSITY POLICIES



FORT HAYS STATE
UNIVERSITY

Forward thinking. World ready.

All University policies can be found on blackboard.