

COURSE SYLLABUS

COSC 1437.01 (CRN: 80323 (lecture)) and **COSC 1437.03** (CRN: 80325 (lab))

Programming Fundamentals II

4 Credit hours

Fall 2016

Time & Location:

Section	Lecture	ABI	Lab	ABI
01	MWF 9:00am – 9:50am	(#209)	W 1:00 – 2:50pm	(#209)

Instructor:

Name: **Qingzhong Liu, PhD**
Office: **AB1 #216D**
Office hours: **MWF 8–9 AM and 10-11AM** (Other times can be available by appointment.)
Phone: **(936) 294-3569**
Email: **liu@shsu.edu**
URL: **http://www.shsu.edu/~qx1005/**

Teaching Assistant:

Name: **TBA**
Office: **TBA**
Office hours: **TBA**
Email: **TBA**

Course description:

This course is **a continuation of COSC1436 (Programming Fundamentals I)** and focus on design, implementation, and re-usability of computer programs with abstract data types. Fundamentals of object-oriented design and programming paradigms are emphasized. Course contents include basic algorithm analyses, search and sorting, graph-related data structures and algorithms, and introduction to software engineering. A two-hour lab-based component is required for student to practice object-oriented programs in more than one programming environment. Prerequisites: COSC 1436 (letter grade 'C' or more) and eligible for MATH 1420. Credit 4.

Course objectives:

Throughout the course, fundamentals of data structures and computer algorithms will be discussed in the context of object-oriented programming. To be more specific, the following will be emphasized: (1) **the concept of data abstraction and fundamental data structures** including lists, queues, stacks, tables, graphs, and so on; (2) **various problem-solving techniques** such as recursion and divide-and-conquer; and (3) other important topics in practical problems including **searching and sorting algorithms**. This is a **second programming course in CS**, thus students are expected to possess some working knowledge of programming and be familiar with concepts such as control structures, functions, arrays, classes, and so on. Students are required to use Java programming language for the required 2-hour labs and programming assignments in more than one programming environment.

Textbooks (optional):

(1) **Data Abstraction & Problem Solving with Java, WALLS & MIRRORS** (3rd Ed.)
by Frank M. Carrano and Janet J. Prichard, Addison Wesley, 2010.

(2) Programming Abstractions in Java, 1/E

by Eric Roberts, Pearson, 2016. ISBN-10:0134421183 ISBN-13:9780134421186

(3) Data Structures and Abstractions with Java, 4/E

by Frank M. Carrano and Timothy M. Henry, Pearson, 2015, ISBN-10: 0133744051
ISBN-13:9780133744057

(4) Starting Out with Java: From Control Structures through Data Structures, 3rd Edition

by Tony Gaddis and Godfrey Muganda, Pearson, 2016, ISBN-13: 9780134038292

Instructor's Objectives (for IDEA):

- (1) **To gain factual knowledge** (*terminology, classifications, methods, etc.*)
- (2) **To learn fundamental principles, generalizations, or theories**

Students' Outcomes (for ABET): For students to get an ability to

- (a) Apply knowledge of computing and mathematics appropriate to the discipline
- (b) Analyze a problem, and identify and define the computing requirements appropriate to its solution
- (i) Use current techniques, skills, and tools necessary for computing practice.
- (j) Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- (k) Apply design and development principles in the construction of software systems of varying complexity.

Academic Calendar: http://www.shsu.edu/~reg_www/academic_calendar/

Course requirements:

Attendance:	Attendance of both lectures and labs are required and counted to 5% of whole grade. The roster will be circulated at the beginning of each lecture and lab; thus, please come to the class on time and give your signature on the roster. If you are absent continuously for two or more classes, you will be reported to the SAM Center via FirstAlert .
Quizzes:	From time to time, lectures will start (or end up) with a brief quiz (5-10 minutes), focusing on fundamentals in data structures and algorithms. The nature of questions will be discussed during each lecture, so students will only need to remember a small amount of material for each quiz.
Reading:	Reading assignment of lecture slide(s) and supplementary materials will be timely announced in the class and/or posted on Blackboard in advance.
Labs:	In the 2-hour required lab each week, students will review the concepts learned in lecture classes as well as practice Java programming. The TA will lead all the lab sections.
Assignments:	Programming assignments will be given periodically (almost every week). Unless otherwise mentioned, each homework should be turned in class (or in Blackboard) on the due date (usually one week after each homework announcement). Late homework is accepted up to the beginning of the next lecture class with a penalty of 50% off of the specified points. Without the prior permission, no further extension will be given. Graded homework and exam papers will be returned back to students usually within one week from the due date. Also, students are required to ask questions or corrections on each graded paper within one week after each posting.
Exams:	Three written exams are planned. Note that tests/exams will be proctored during 2-hour lab so as for students to have sufficient testing time. Exam date will be announced and posted in Blackboard at least one week prior to each exam. There is no make-up

examination available for any students. Students who fail to take one of the three exams will fail the class automatically unless excused for good cause by the college Dean.

Electronic Devices:

Please keep all electronic devices (e.g., laptops and phones) put away (or in your backpack) and silenced during class. You are not allowed to use any electronic device during the lecture and/or discussion, unless otherwise permitted in advance if necessary for your learning or for your special need. Focusing on lecture and participating discussion are the best way to use time and learn topics of each class. Additionally, if you are texting in class and you will be asked to leave class. I take this very seriously.

Weekly schedule:

The following schedule is preliminary and subject to change. We'll try to follow this schedule as much as possible. However, just in case, we need to change/rearrange the schedule, updates or changes will be announced at least one week in advance. Lecture slides and other supporting resource will be available in Blackboard.

PLAN A			
Ch	Topic	Assignment	Note
01	Review of Java Fundamentals	TBA	Quiz
02	Principles of Programming & Software Eng.	TBA	Quiz
04	Data Abstraction: The Walls	TBA	Quiz
05	Linked List	TBA	Quiz
07	Stacks	TBA	Quiz
08	Queues	TBA	EXAM1
11	Trees	TBA	Quiz
14	Graphs	TBA	Quiz
03	Recursion	TBA	Quiz
06	Recursion as a Problem-Solving Technique	TBA	EXAM2
10	Algorithm Efficiency & Sorting	TBA	Quiz
12	Tables and Priority Queues	TBA	EXAM3

PLAN B			
Ch	Topic	Assignment	Note
01	Review of Java Fundamentals	TBA	Quiz
02	Principles of Programming & Software Eng.	TBA	Quiz
03	Recursion	TBA	Quiz
06	Recursion as a Problem-Solving Technique	TBA	EXAM1
04	Data Abstraction: The Walls	TBA	Quiz
05	Linked List	TBA	Quiz
07	Stacks	TBA	Quiz
08	Queues	TBA	EXAM2
10	Algorithm Efficiency & Sorting	TBA	Quiz
12	Tables and Priority Queues	TBA	Quiz
11	Trees	TBA	Quiz
14	Graphs	TBA	EXAM3

Grading plan & criteria:

(1) Attendance	5%
(2) Quizzes	5%
(3) Assignments & Labs	35%
(4) First exam	15% (Date TBA)
(5) Second exam	20% (Date TBA)
(6) Final exam	20% (Date TBA)

(7) Bonus	(10%, OPTIONAL)
TOTAL	100% (110%)
Finally, $90\% \leq \text{TOTAL} \leq 100\% \Rightarrow$	"A"
$80\% \leq \text{TOTAL} < 90\% \Rightarrow$	"B"
$70\% \leq \text{TOTAL} < 80\% \Rightarrow$	"C"
$60\% \leq \text{TOTAL} < 70\% \Rightarrow$	"D"
$0\% \leq \text{TOTAL} < 60\% \Rightarrow$	"F"

Visitors in the classroom: Occasion visiting of classes by responsible persons is allowed with prior arrangement with the instructor, as long as it does not interfere with the registered members of the class or the educational process.

Rules of conduct: Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus impedes the mission of the university. Please turn off or mute your cellular phone and/or pager before class begins. Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking among each other at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a, minimally, a directive to leave class or being reported to the Dean of Students for disciplinary action in accordance with university policy.

Class participation: In accordance with University Policy, regular attendance is required and your attendance will be seriously monitored (<http://www.shsu.edu/students/guide/polpro/attendance.html>). So, don't forget to give your signature on the roster. You are responsible for all material covered in classes and labs, regardless of whether you attended or not. It is your responsibility to obtain class materials from fellow classmates if you miss a class.

Academic dishonesty: All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The university and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials. No cheating on an examination or assignments is allowed. A score of zero will be given to the student if such a case occurs.

Other administrative matters:

Students with Disabilities Policy: It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly

confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see: <http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf>

Religious Holidays: An institution of higher education shall excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.