# Course Syllabus

# CS362.01    Data Structures

## Spring 2008, 3 Credit Hours

**Location / Time**    AB1-209, 8-8:50 A.M., MWF

**Instructor:**    **David Burris, Ph.D., CCP, CSP**

**Office:**    **AB1-213C**

**Phone / web:**    **294-1568, csc_dsb@shsu.edu**
**Course information is available via Blackboard**

**Office Hours:**    2-3 MW, 8-10:00 TTh, others by appointment.  I am actually on campus most of the time. I may not always be able to stop what I am doing, but you are free to drop by any time you need help.

**Departmental Course Objective:**  Introductory treatment of such topics as orthogonal lists, strings, arrays, linked lists, multilinked structures, indexed files / direct files, generalized data management and database management systems.  Students should not take this course unless they are confident of their ability to write computer programs.  The class emphasizes concepts which the student will implement in lab assignments.  Prerequisites: CS147 and confidence in your ability to write programs.  Credit 3 hours.

**Instructor Specific Objectives:**  Sequential and link allocated memory implementations of stacks, queues, and deques.  One dimensional, multidimensional, and triangular matrices will be implement using contiguous and linked memory allocation.  Appropriate algorithms to efficiently search sequentially allocated memory where instances an item may only appear at most one time, may appear more than one time, and where the items is not expected to appear are investigated.  Similar algorithms for link allocated data structures.  Additional algorithms including self-organizing list, binary searches, hashing are studied.  Theoretical and practical determination of appropriate search algorithms for both internal and external memory is studied.  Internal / external memory sorting including topological sorting, sort by selection, bubble sort, radix sorting, and additional algorithms will be studied.  A detailed discussion is held with respect to general considerations affecting the efficiency of sorting algorithms.  Application of binary trees, m-ary trees, and forest (both recursive and iterate algorithms) are applied to business, scientific, engineering, and artificial intelligence applications.  Additional commercially applicable algorithms such as locating misspelled keys are covered.  Multi-list and inverted list in both main

memory and auxiliary memory are considered with respect to search algorithms and implementing commercial database products.

Quantitative techniques for estimating algorithm performance are required.  Use of "abstract data types" is emphasized for implementation.  Students will develop a greatly expanded knowledge of the programming language or languages selected for implementation.

**Text:**  No text is required for this course.  All material utilized in class is available on Blackboard.  Students are urged to make a copy of the class notes in facilities operated by university Computer Services.  Notes should be bound for use in class.  The instructor retains all copyright privileges to instructional materials.  Students registered for the class are authorized to make a copy of instructional material for their own use to complete the course.  Instructional materials may not be distributed in part or whole to others without the expressed written approval of the instructor.

Most book stores carry an excellent selection of texts on data structures.  The usefulness of any text is directly related to the time you spend reading and studying the material.  Do not purchase a text unless you plan to utilize the text.

**Required Supplies:**  None.

**Option Texts / Supplies:**  It is convenient but not necessary to have your own computer and software.  Access to free, inexpensive, and commercial suggested software is available on Blackboard.  Language manuals related to software are listed on Blackboard.

**Attendance Policy:**  Students are encouraged to attend all classes, but absences will not be used in computing the course grade.  *A zero will be recorded for all work missed due to absence unless arrangements to complete missed work are made prior to the class that is missed.*  The university does request we report when students stop attending class.

**Assignments:**  All assignments are posted on Blackboard.  It is the student's responsibility to check Blackboard sufficiently often to obtain class assignments.  New course materials are also made available to students via Blackboard.  Assignments and other notifications are frequently emailed via Blackboard to "university email accounts" of students officially registered for the course.  Private email accounts will not be utilized for course communications.

**Tentative test dates:**  Friday February 22, Wednesday March 19, Friday April 18, and the final.

**Grading:**  Three to four equally weighted exams will be administered during the semester including the final exam.  Exams will constitute 50% of the course

grade. The final exam will be comprehensive. Other assignments will constitute the remaining 50% of the grade. In the event a student scores higher on the final exam than one of the regular tests, the lowest regular test grade, will be dropped and the grade on the final exam doubled, provided that all other assignments have been completed with a grade of 70 or higher. Under no circumstances will a course grade higher than "C" be awarded to a student not making at least a "C" on every lab assignment. The scale of A = 90-100, B = 80-89, C = 70-79, D = 60-69, F= below 60 will be used.

Extensive use of essay questions and writing original algorithms is made on exams. Students are expected to be able to express solutions in a programming language appropriate to the proposed problem. Quantitative evaluation of algorithm performance will be utilized in class and on exams.

Assignments are due at the start of class. Once class starts, anything turned in will be graded as "late" work. Assignments given to the departmental secretaries, placed in my mailbox, etc., will not be graded. All work must be given to me personally. Late work is subject to a penalty of zero to ten points per period it is late (at the discretion of the instructor). No credit will be allowed for assignments that specifically state they may not be submitted late. I do not encourage late labs but desire your best effort. Request to submit a lab late in order to complete a higher grading option should be made prior to the due date.

Copies of graded test and labs may be retained to meet department accreditation requirements.

**<span style="color:orange">Academic Integrity:</span>** 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.

Assignments made form one semester to the next are similar of necessity. Assignments are developed with the goal of providing a student with the opportunity to develop the desired level of intellectual achievement while not over burdening the student with excessive work. The use of work done by other students past or present will be construed as cheating. "Any" verifiable instance of cheating will normally result in a grade of <u>"F" for the course for all individuals involved.</u> Students should not have in their possession labs or tests belonging to other students from the current or previous semesters.

Students from previous semesters providing materials to students in following semesters will be subject to all disciplinary actions provided by the university.

**Classroom Rules of Conduct**:  University policy states students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the University.  Cellular telephones and pagers and other disruptive devices must be turned off prior to the start of class.  Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction.  Inappropriate behavior in the classroom shall result in a directive to leave class.  Students who are especially disruptive will be subject to removal by University Police and / or reported to the Dean of Students for disciplinary action in accordance with university policy.

**Visitors in the Classroom:**  Permission to visit is at the discretion of the instructor.  In general, individual wishing to visit a class must present a current, official SHSU identification card to be permitted in the classroom.  They must not present a disruption to the class by their attendance.  Deviation for these guidelines is at the sole discretion of the instructor.

**Americans with Disabilities Act**:  Strict adherence to all SHSU ADA policies will be observed.  Disabled students may request assistance with academically related problems stemming from individual disabilities by contacting the Director of the Counseling Center in the Lee Drain Annex or by calling (936) 294-1720.

**Religious Holidays:**  Students wishing exception for religious holidays must meet all university guidelines and deadlines listed in the catalog, calendar, and university policy at http://www.shsu.edu.  In general all test and work to be missed must be completed prior to the absence.

Updated December 25, 2007