

COURSE TITLE BLACKBOARD SITE	MCS 2534 Data Structures Spring 2012 – http://my.ltu.edu and select CRN 3828
INSTRUCTOR	David Fawcett Math & Computer Science Contact Information fawcett@ltu.edu , djfawcett@comcast.net Phone to be posted on Blackboard (mobile & text) Office hours by appointment
SCHEDULE	January – May 2011 Students please refer to http://www.ltu.edu/registrars_office/calendar_final_exam.index.asp for the last date to withdraw and other important registration related information.
LEVEL/HOURS PREREQUISITE	Undergraduate Degree / 4 credit hours MCS 2514 (CS II) & MCS 2523 (Discrete Math)
REQUIRED TEXT (See Blackboard for additional resources)	Mark Allen Weiss, Data Structures and Algorithm Design in C++, 3rd edition, Addison Wesley, ISBN 978-0321441461 Authors web site http://www.aw.com/cssupport Available for online purchase or rent through LTU Bookstore at: http://lawrence-tech1.bkstore.com/bkstore/TextbookSelection.do?st=489
ADDITIONAL RESOURCES	LTU Online student resources: http://www.ltu.edu/ltuonline/
TECHNICAL SUPPORT	Technical support for using Blackboard is provided by the Helpdesk, 248.204.2330 or helpdesk@ltu.edu . Send the Help Desk a form detailing any issues by clicking here http://tinyurl.com/3yqrvne .

COURSE SCHEDULE FOR TRADITIONAL SEMESTER COURSES

This fully online course begins with a partial week online course orientation period to familiarize yourself with the online learning environment and to meet online or via the phone with your instructor. Each subsequent week starts on a Monday and ends on a Sunday. All assignments due at end of week (EOW) unless otherwise noted.

Dates	Modules	Topics / Readings	Assignments Due
Prior to Semester Start and Jan 16 – Jan 18	Module 0	Overview of textbook Online Learning Orientation Course Orientation and group formation	Course orientation Instructor conversation Individual pre-assessment
Week of Jan 16 – Jan 22	Module 1	Chapter 2 Big-O Notation	Read chapter HW Ch2 P.64 2.1 & 2.2 Discussion board
Week of Jan 23 – Jan 29	Module 2	Data Structure Workbench\	Practice w/ DSWB
Week of Jan 30 – Feb 5	Module 3	Chapter 3 Stacks, Queues Linked Lists	Read chapter Bb Discussion Board Web research – stacks & queues. Bb Discussion Board. Code doubly linked lists EOW
Week of Feb 6 – Feb 12	Module 4	Lab 1	Code Bucket Sort/Radix Sort. Post graphs and discuss. Due in 3 Weeks.
Week of Feb 13 – Feb 19	Module 5	Chapter 5 Hashing	Read chapter Web research Bb Discussion Board
Week of Feb 20 – Feb 26	Module 6	Chapter 5 Hashing continued Assessment 3	Bb Discussion Board Ch5 P. 208 5.1 & 5.2 Web research
Week of Feb 27 – Mar 4	Module 7	Lab 2	Code Hashing Algorithms Post graphs and discuss Due in 3 Weeks.
Week of Mar 5 – Mar 11	Module 8	Chapter 4 Trees	Read chapter Bb Discussion Board Web research
Mid-semester Break – No Classes			

Dates	Modules	Topics / Readings	Assignments Due
Week of Mar 19 – Mar 25	Module 9	Chapter 4 Trees continued	Bb Discussion Board Web research HW Ch4 P. 175&176 4.9 & 4.19
Week of Mar 26 – Apr 1	Module 10	Chapter 6 Priority Queues	Read chapter. Web research Bb Discussion Board Ch6 P. 252 6.4
Week of Apr 2 – Apr 8	Module 11	Chapter 7 Sorting Part I	Read chapter Bb discussion Board Web research
Week of Apr 9 – Apr 15	Module 12	Lab 3 - Your Increment sequences (Thanksgiving week)	Bb Discussion Board Progress updates
Week of Apr 16 – Apr 22	Module 13	Chapter 7 Sorting Part II	Bb Discussion Board Web research P. 306 7.1, 7.3, and 7.4
Week of Apr 23 – Apr 29	Module 14	Chapter 9 Graphs	Read chapter Bb Discussion Board Web research Ch9 P.396 9.1, P.397 9.5 a, b, P.397 9.7 a, b.
Week of Apr 30 – May 6	Module 15	Chapter 9 Graphs	Read chapter Bb Discussion Board Web research Ch9 P.396 9.1, P.397 9.5 a, b, P.397 9.7 a, b.
Week of May 7 – May 12	Final Exams		

STUDENT EVALUATION

The course has the assignments listed below. Letter grades are awarded based on the total number of points achieved. Points are deducted for late assignments.

Assignments	Points
6 Text book HW Problems	30
3 Labs	150
9 Assessments	90
3 code related HW problems	30
Discussion board	150
Final	100
Total Points	550

Class Points	Letter Grade
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96 and above	A
90 – 95	A-
87 – 89	B+
83 – 86	B
80 – 82	B-
77 – 79	C+
73 – 76	C
70 – 72	C-
61 – 70	D (Undergrad Only)
60 and below	E

Note: Grades lower than a "B" fall below the LTU graduate standard

EDUCATIONAL GOALS

The student will know about the common data structures and algorithms used in computer science and see the mathematical basis for them.

The student will program these data structures and algorithms and measure the performance for him/herself so that they can use this skill in their outside work.

STUDENT LEARNING OBJECTIVES / OUTCOMES

(1)The student will be able to evaluate existing computer programs to determine how to improve scalability by using appropriate data structures and algorithms used in industry.

(2)The student will be able to synthesize (new) computer programs and methods so that they have the best/most appropriate data structures and algorithms that give the desired performance.

PREREQUISITE SKILLS

The student must have completed Computer Science II and Discrete Mathematics.

The student must be able to write computer programs in C++.

The student must be willing and able to use MS Visual Studio C++ 2010 when doing the labs.

INSTRUCTIONAL METHODS AND COURSE ORGANIZATION

Blackboard Learning Environment – Blackboard at my.ltu.edu contains the syllabus, all assignments, reading materials, streaming videos, narrated PowerPoint mini-lectures, podcasts, written lecture notes, chapter quizzes, links to Web resources, and discussion forums. You will submit all assignments via Blackboard, and are expected to participate regularly in discussion topics. Please take time to familiarize yourself with the organization of the Blackboard site. You will want to check the site frequently for announcements reminding you of new resources and upcoming assignments.

Student/Instructor Conversations – Students keep in touch with the instructor via e-mail messages, telephone conference calls, and short IM conversations.

Self-Assessments – Pre- and post- self-assessment tools will help students measure their entering skills and progress during the course.

Required Reading – Textbook chapters should be read according to the schedule outlined in the syllabus. Chapters will be discussed online.

Publisher Web Site – A publisher web site at <http://www.aw.com/cssupport> includes instructional materials, PowerPoint slides, case studies, application exercises, and practice quizzes. You should make use of as many of these resources as you need to be successful.

Assignments – Most Modules listed above will have a corresponding Practice module. This practice module will contain source code to be evaluated, or instructions and/or guidance for using the Data

Structure Workbench (DSB) or Web to learn more about a topic. The practice module will have detailed instructions. In addition there will usually be a homework assignment from the text. Each chapter has a quiz.

CLASS POLICIES AND EXPECTATIONS

I plan to offer you a valuable learning experience, and expect us to work together to achieve this goal. Here are some general expectations regarding this course:

Each student has a LTU email account. If you wish to use a different email address for this course, please **change your email address in Blackboard under “Blackboard Tools”, then “Personal Information”** and send an email to me to store your email address in my directory.

Readings, discussion forum participation, and written assignments must be completed according to the class schedule. It is important to contact the instructor as needed to discuss personal needs regarding course requirements and assignments.

It is essential that all students actively contribute to the course objectives through their experiences and working knowledge.

All assignments must be submitted on schedule, via Blackboard, and using Microsoft Office compatible software. If you need to submit an assignment via email, contact the instructor in advance.

Assignments must be completed to an adequate standard to obtain a passing grade. Requirements for each assignment are detailed in this syllabus.

Be prepared to log into Blackboard at least once each day. Please focus your online correspondence within the appropriate Blackboard discussion forums, so that your colleagues may learn from you.

At midterm and at the end of the course, you will be invited to participate in a University evaluation of this course. Your feedback is important to the University, to LTU Online, and to me as an instructor, and I strongly encourage your participation in the evaluation process.

It is important for you as students to know what to expect from me as your instructor:

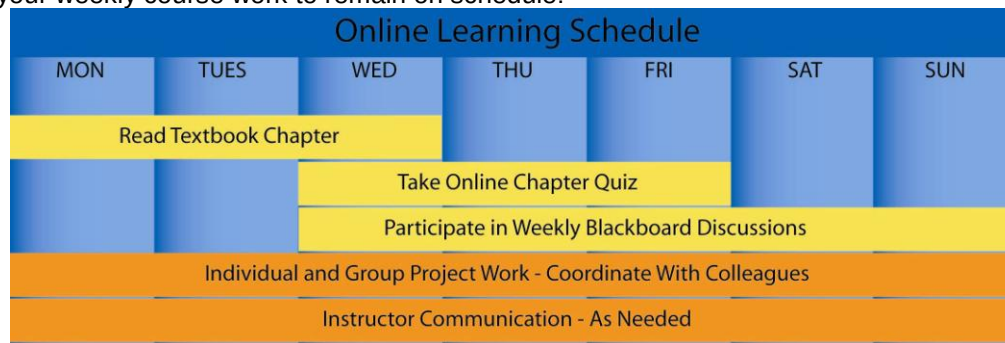
- I will be available to you via e-mail and phone, and will promptly reply to your messages.
- I will be available to you for face-to-face appointments as requested.
- I will maintain the Blackboard web site with current materials, and will resolve any content-related problems promptly as they are reported to me.
- I will send out a weekly e-mail update to all class members to guide upcoming work and remind you of assignment due dates.
- I will return all assignments to you promptly, and will include individualized comments and suggestions with each assignment.
- I will hold our personal written or verbal communications in confidence. I will not post any of your assignments for viewing by the class without requesting your approval in advance.
- I will treat all members of the class fairly, and will do my best to accommodate individual learning styles and special needs.
- If any of these points need clarification, or should special circumstances arise that require my assistance, please contact me so that we may discuss and resolve the matter.

PRACTICAL GUIDELINES FOR CLASS LOAD EXPECTATIONS

A three-credit course generally requires at least nine hours per week of time commitment. Here are some practical guidelines to help schedule your time commitments for this online course:

- A 14-week semester (the Summer semester is compressed into 10 weeks) would require at least 126 hours of time commitment to successfully complete all readings, activities, assignments, and texts as described in this syllabus.
- You should reserve at least 6 hours per week to read the required textbook chapters and resources, participate in online discussions, review presentation materials, and work through online quizzes. This effort will total at least 84 hours over the course of the semester.
- You should organize your remaining time to roughly correspond with the point value of each major assignment. This means that you should plan to spend at least:
 - 8-9 hours preparing your case study review;
 - 24-40 hours working with your group on the three parts of your semester-long project;
 - 8-9 hours working on the various components of your reflective consolidation (final exam).

These guidelines may not reflect the actual amount of outside time that you – as a unique individual with your own learning style – will need to complete the course requirements. The number of hours each week will vary based on assignment due dates, so please plan ahead to insure that you schedule your academic, work, and personal time effectively. The following graphic may be used to guide you in planning your weekly course work to remain on schedule:



ASSIGNMENT DETAILS

Course assignments and evaluation criteria are detailed below. Please review these requirements carefully. See the section Academic Resources / Assessment Guidelines for information about assessment of written and oral presentations.

Details for all assignments are shown below. Please note that you should not submit any assignments to the Blackboard "Digital Drop Box." All assignments are submitted using the Blackboard "Assignments" or "SafeAssign" function. Some assignments are also posted to the Blackboard Discussion Forum for student comments.

Assignments from Text Problems (14 Points)

Homework Assignments from the text are as follows:

1. HW Ch2 P.64 2.1 & 2.2
2. HW Ch3 Modify instructor code LL.zip to add backward pointer and then print the list backwards.
3. HW Ch4 P. 175&176 4.9 & 4.19
4. HW Ch5 P. 208 5.1 & 5.2
5. HW Ch6 P. 252 6.4
6. HW Ch7 P. 306 7.1, 7.3, and 7.4
7. HW Ch9 P.396 9.1, P.397 9.5 a & b, P.397 9.7 a & b

Each of these assignments is worth 2 points. Deliverable is a turned in assignment with the answers to the homework problems just like in a F2F class.

Assessments (36 points) and labs (30 points) are as follows.

Twelve assignments are all worth 3 points, and three labs are worth 10 points each:

Module	Type of assignment	Subject of paper, or lab, or practice
1	Big-O assessment.zip	Put counters and timers in code I supply, produce graphs, and use DSWB to view
2	DSWB Graph	Use DSWB to import from "edit1.txt" and send me the graph
3	Paper	Stacks, queues, and linked lists
3	Code	Modify code given you to make a double linked list
4	Lab 1	Radix sort lab coded from labshell provided
5	Paper	Hashing algorithms and the internet
6	Paper	Double hashing
7	Lab 2	Hashing
8	Paper	Lazy deletion
9	Paper	Convert BST to AVL
10	Paper	Uses of priority queues
11	Paper	Shell, Hibbard and Sedgewick sorts
12	Lab 3	Create your own increment series and find Big-O
13	Paper	Merge sort and quick sort - pros/cons/worst case
14	Paper	Explain the Dijkstra algorithm - why won't it work right for graphs with negative e
15	Discussion Board	What did you learn in this course, how will it help you in your career

Deliverables and Evaluation – Submit your homework assignments via Bb. Word, Excel or Journal format is preferred; however I will accept text (txt, rtf), Excel, or scans.

Submit code assignments by zipping the Visual Studio project folder (after deleting the debug folder) and submitting via Bb assignments.

Evaluation of your work:

Homework from the text – Your homework is noted and returned to you for you to grade – I will post the homework solutions. If you do the HW you get 5 points (each assignment), otherwise you get zero points. If you have questions on the homework solution, you can contact me individually.

Web research and discussion: A few paragraphs usually will suffice. Don't just cut and paste, give your own interpretation of what you found. Discuss how it meshes with what we are learning. Provide URLs.

Code bases assessments:

These problems contain C++ code plus questions about the code. You are expected to already be a competent programmer. Mainly you will be just downloading and executing the code, then giving your responses to the questions about your observations.

Labs:

The labs assignments have you writing your own code in a "shell" that I provide. Most of the "grunt work" is done for you. You only have to write the algorithm and instrumentation. You are expected to already be a competent programmer. I am not grading you on style or documentation; however, SOME comments are useful. You have three weeks to complete the lab assignments. The shell I give you produces the graphs which you can see in the Data Structure Workbench – you don't have to use Excel, and you don't have to know how to produce graphs. The shells are C++ Console (DOS window) applications. I will look at your code, execute your code and inspect the graphs that are produced. If the code is not "grade-worthy" I will return the code with guidance for you to fix it. I will accept multiple attempts until time runs out.

Assessments and Online Participation

Each student is expected to actively participate in online activities. Class participation is evaluated to a maximum of 150 points based on: whether you submit a post, and quality of post.

Reading the required text chapters and working through the homework according to the class schedule is worth up to 60 points.

Assessments are graded just like they would be if done in a face to face (F2F) class. Assessments consist of nine written research papers, three coding exercises, and 3 labs will be in MS Word or Excel. Return the completed Assessment via Bb assignments. Partial credit is given. You may use OneNote or Journal or Word, Excel. If more than one file or file type is needed, compress (zip or "rar") them into one file.

Assignment submitted on time – Late penalty: 10% off for each day.

SYLLABUS ADDENDA

Please see the LTU Online "Current Students" web site <http://www.ltu.edu/ltuonline/> for comprehensive information about Lawrence Tech's academic services, library services, student services, and academic integrity standards. The content of this web site is explicitly included in these syllabus requirements.

The LTU Online "Current Students" web site also includes grading rubrics used by your instructor to evaluate written assignments, discussion forum participation, and group assignments. Please note that the SafeAssign anti-plagiarism product will be used for written assignments submitted for this course. Please see the instructions included on the [eHelp web site](#) regarding the use of the SafeAssign product.

Undergraduates: Leadership Transcripts

The leadership transcript enables students to track co-curricular activities that are undertaken above and beyond the requirements of the LTU curriculum. The leadership transcript serves students by enhancing the leadership portfolio; providing the opportunity for a transcript of distinction; enhancing their resumes; and assisting in articulating leadership experience. It can be accessed by logging on to Banner Web and clicking the Student and Financial Aid tab. Leadership Activities is located at the bottom of the list.