CS 2420	Introduction to Data Structures and Algorithms Spring Semester 2016

Instructor	Kyle Feuz Office: TE 111C Phone: 801-626-7864 E-mail: kylefeuz@weber.edu Office Hours: M,W 11:30-12:30 pm, T,TH, 10:30-11:30am Office Hours @ D2 226: M,W: 4:45 – 5:20 pm
Classroom	TE 109C
Days	M, W
Time	9:30-11:20 AM
Texts	*Data Structures Using C++* (2nd edition) by D. S. Malik ISBN 978-0324782011
Description	General principles of common data structures and design of efficient algorithms. Topics include: arrays, linked-lists, stacks, queues, trees, graphs, tables, storage and retrieval structures, searching, sorting, hashing, and algorithmic analysis. Emphasis will be on abstraction, efficiency, re-usable code, and object-oriented implementation.
Learning Outcomes	• gain skills in a software development workplace environment • identify the benefits and drawbacks of object-oriented program design • implement common search and sorting algorithms • understand and implement common data structures including, static and dynamic arrays, vectors, linked lists, stacks, queues, and binary trees • analyze algorithms and data structures in terms of time and space
Class	Class will consist of lectures, discussions, assignments, quizzes and exams. Questions and comments are encouraged. It is expected that students will read the material related to each week's coursework.
Programming Projects	There will be biweekly programming projects for the class. The specifics of each assignment will be posted on Monday. The due date for each assignment will be two weeks later on Sunday at 11:59 pm (unless otherwise specified.) Late assignments will be accepted with a 10% penalty per day up to 5 days to provide for unforeseen circumstances. There will be an 8 hour grace period during which no late penalty will be assigned. Assignments count for 40% of the final grade. All the assignments must be written in C++ and should compile and run on both Windows and Linux (don't use operating specific, non-standard code). You can test your programs on athena (for windows) and icarus (for linux) if you do not have your own machine running windows or linux. The assignments will be graded using the following rubric. 5% for correct submission format 7.5% for comments and readability 7.5% for code that compiles on both windows and linux 10% for effort 10% for no memory errors (as checked by valgrind) 60% for code that passes the written test cases

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<tr><td></td><td>Note that in order to pass any test cases your code must compile. If your code does not compile the best score you can get is 15% for submission format and comments/readability. If you code does not compile on linux you cannot get any points for memory errors since valgrind only runs on linux.

Submission format:
You should submit a zip file containing only the source code to your program. Do not submit IDE project or solutions files. Only submit your .cpp and .h files. If your program requires special instructions to compile or run you should include a readme text file as well.</td></tr>
<tr><td>Programming Practice</td><td>There will be weekly short programming practice assignments. These will be assigned in-class and you will be given time to work on them in class. You will turn in what you have at the end of class on Thursday (i.e. you do not need to spend time working on this outside of class unless you miss class). If you miss class you can still turn in the assignment for credit by Saturday at midnight. These assignments will not be accepted late unless prior arrangements are made. The weekly practice assignments are worth 10% of your grade. You lowest two assignments will be dropped to provide for unforeseen circumstances.</td></tr>
<tr><td>Quizzes</td><td>There will be quizzes for the class on the conceptual material, worth 10 points each. A quiz will be posted on Friday and will be due on the following Wednesday at 11:59. You make take the quiz as many times as you want before the due date and the highest score will be kept. Your lowest two quiz scores will be dropped to provide for unforeseen circumstances. Quizzes count for 10% of the final grade.</td></tr>
<tr><td>Exams</td><td>There will be three exams for the class. Exams count for 30% of the final grade (the Midterm Exams being worth 7.5% each, and the Final Exam being worth 15%.)</td></tr>
<tr><td>Accommodations for disabilities</td><td>Any student requiring accommodations or services due to a disability must contact Services for Students with Disabilities (SSD) in room 221 of the Student Services Center here at the Davis Campus. SSD can also arrange to provide course materials (including this syllabus) in alternative formats if necessary. You can also call 801-395-3524 or visit http://www.weber.edu/ssd for more details.</td></tr>
<tr><td>Grading</td><td>
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<tr><td>Quizzes</td><td>10%</td></tr>
<tr><td>In-Class Assignments</td><td>10%</td></tr>
<tr><td>Programming Assignments</td><td>50%</td></tr>
<tr><td>Exams</td><td>30%</td></tr>
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The final grade will be given based on points accumulated through quizzes, assignments and exams. Standard grading will apply:

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<tr><td>94 – 100</td><td>A</td><td></td><td>74 – 76</td><td>C</td></tr>
<tr><td>90 – 93</td><td>A-</td><td></td><td>70 – 73</td><td>C-</td></tr>
<tr><td>87 – 89</td><td>B+</td><td></td><td>67 – 69</td><td>D+</td></tr>
<tr><td>84 – 87</td><td>B</td><td></td><td>64 – 67</td><td>D</td></tr>
<tr><td>80 – 83</td><td>B-</td><td></td><td>60 – 63</td><td>D-</td></tr>
<tr><td>77 – 79</td><td>C+</td><td></td><td>0 – 59</td><td>E</td></tr>
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Allocated Time	You should anticipate spending two to three hours of study per week for each credit hour of a university course. Computer and programming classes typically require time in the upper range.
Canvas	This course will have a strong online component via the Canvas course management system. To log on to the course, go to http://canvas.weber.edu, and follow the login instructions. You will need your WSU wildcat name and password to log in. You should have already received this information from the admissions department. If you still have problems getting into the course, please email me and I will see if I can resolve the issue. If you are unfamiliar with Canvas, go to https://learn-wsu.uen.org/courses/8878 for a student orientation. Click on the links on the left side of the page. PDF help documents are available at http://departments.weber.edu/ce/distancelearning/CanvasFAQ.aspx
Policies	Exams can only be taken on the days given unless arrangements are made to take them ahead of time. If you do not take the final and you do not have a passing grade you will receive a UW.
Cheating	Students are expected to maintain academic ethics and integrity in regards to performing their own work. The WSU Student Code states clarifies cheating. 1. Cheating, which includes but is not limited to: a. Copying from another student's test paper; b. Using materials during a test not authorized by the person giving the test; c. Collaborating with any other person during a test without authority; d. Knowingly obtaining, using, buying, selling, transporting, or soliciting in whole or in part the contents of any test, without authorization of the appropriate official; e. Bribing any other person to obtain any test; f. Soliciting or receiving unauthorized information about any test; g. Substituting for another student or permitting any other person to substitute for oneself to take a test. 2. Plagiarism, which is the unacknowledged (uncited) use of any other person or group's ideas or work. This includes purchased or borrowed papers; 3. Collusion, which is the unauthorized collaboration with another person in preparing work offered for credit; 4. Falsification, which is the intentional and unauthorized altering or inventing of any information or citation in an academic exercise, activity, or record-keeping process; 5. Giving, selling or receiving unauthorized course or test information; 6. Using any unauthorized resource or aid in the preparation or completion of any course work, exercise or activity; 7. Infringing on the copyright law of the United States which prohibits the making of reproductions of copyrighted material except under certain specified conditions;

	CS Department policy dictates that any verifiable evidence of student academic cheating, as defined and determined by the instructor, will result in: 1) an automatic failing grade for the class and 2) a report to the Dean of Students that will include the student's name and a description of the student's dishonest conduct.

Class Schedule and Course Outline

Week of	Reading/Topic	Coursework
Jan 11 Week 1	Ch. 1: Introduction, C++ review, Algorithm Analysis	
Jan 18 Week 2	**No class on Monday** Ch. 2: ADT, Object Oriented Design (Inheritance, Polymorphism, Templates)	Quiz 1 Assignment #1
Jan 25 Week 3	Ch. 3: Pointers and Classes (Special considerations)	Quiz 2
Feb. 1 Week 4	Ch. 4,6: STL, Recursion	Quiz 3 Assignment #2
Feb. 8 Week 5	Review Ch. 5: Linked-Lists	**Midterm Exam 1**
Feb. 15 Week 6	**No class on Monday** Ch. 7: Stacks	Quiz 4
Feb. 22 Week 7	Ch. 8: Queues	Quiz 5 Assignment #3
Feb. 29 Week 8	Ch. 9: Searching and Hashing Algorithms	Quiz 6
Mar. 7 Week 9	**Spring Break**	
Mar. 14 Week 10	Ch. 10: Sorting Algorithms	Quiz 7 Assignment #4
Mar. 21 Week 11	Review	**Midterm Exam 2**
Mar. 28 Week 12	Ch. 11: Trees	Quiz 8
Apr. 4 Week 13	Ch. 11: Trees Thanksgiving Break	Quiz 9 Assignment #5
Apr. 11 Week 14	Ch. 12: Graphs	Quiz 10
Apr. 18 Week 15	Ch. 12: Graphs	Quiz 11 Assignment #6
Apr. 25	Review **Final Exam – Comprehensive (Chapters 1-12)** **(Apr 26 – Apr 28)**	**Final Exam**