

Fall 09
**CS 33001 – 600 Computer Science II: Data
Structures and Abstraction**

*Department of Computer Science
Kent State University Stark*

TR 3:30 PM - 4:45 PM - Room MH 306

Instructor: [Dr. Angela Guercio](http://www.personal.kent.edu/~aguercio/Fall09/CS33001-600Fa09.html)

Office: 424, Main Hall

Phone: 330 244-3424 (KSU ext. 53424)

Office Hours: TR 10:00am - 10:55am 12:25pm - 1:55pm 4:55pm - 5:25pm

other times are available by appointment

Best way to contact me: e-mail to aguercio@kent.edu

Course Information
Class Webpage: http://www.personal.kent.edu/~aguercio/Fall09/CS33001-600Fa09.html • all important class information will be posted on the class webpage, readings, assignments, notes, deadlines, cancellations, ect.. • You must CHECK THE CLASS WEBSITE REGULARLY!!!
Prerequisites: CS 23022, CS23021 with <i>a grade of C or better</i> . This means that a C- in CS23021 is not sufficient to meet the prerequisite. For more details, please visit http://www.cs.kent.edu/programs/ugrad/planner.html
Credit: 3 Credit Hours
Required Text: W. Ford, W. Topp – <i>Data Structures with C++ using STL</i> – Prentice Hall, 2 nd Edition, 2001 The PC Source Code of the book can be found at http://www1.pacific.edu/~wford/fordtopp/cs2book/cs2_index.html
Emergency: In case of an emergency please contact the security on campus. Security phone on campus: #53123 Security cell phone (330) 705-0430 or, of course, 911. I recommend that you program into your cell phone the previous numbers.

Course Outline and Objectives

This course is a direct continuation of Introduction to Object Oriented Programming. This course will introduce you to the fundamentals of data structures from an object oriented perspective.

The course covers:

- The definition of data structures;
- Object Oriented Techniques;
- Algorithms;
- Sequence containers;
 - o Arrays
 - o Vectors
 - o List
 - o Dequeue
- Dynamic Memory and Pointers;
- Iterators;
- Linked Lists;
- Adapter Classes;
 - o Stacks
 - o Queues and Priority Queues
- Binary Trees;
- Associative Structures;

The objectives of the course are:

- to learn the use of appropriate data structures;
- to become familiar with a formal representation of a data structure;
- to recognize STL container classes;
- to introduce you to the implementation of different data structures;
- to show how to manipulate data structures as well as how to access data structures;
- to deepen your program design abilities;
- to show how the use of the appropriate data structure effects the efficiency of the solution;
- to expose you to the design and the testing of C++ programs using data structures via hands-on experience.

The course satisfies a requirement for the Computer Science major and minor and is a prerequisite of several other courses in the CS major.

Class Requirements and Expectations

- **Regular class attendance is REQUIRED.**



There tends to be a strong correlation between class attendance and grade performance. If you will miss a class or a lab, **let me know ahead of time**. In any case, you are responsible for bringing yourself up to date on class material and assignments.

 Since class participation and regular attendance are part of the final grade, **if you miss more than 5 classes without a documented reason or without making prior arrangements with me, your final grade will be dropped one grade (A to B, B+ to C+ and so on).**

- **Reading ahead is REQUIRED.**

 The readings are posted online on the class webpage. You must read the material **before** class **and again after** the class.

 Regular study of the material is REQUIRED. We will roughly cover 1 chapter per week.

- **COMPLETE the assigned homework (i.e. projects and exercises).**

 Assignments will be issued on a regular basis and they will be posted online on the class webpage.

 The class webpage will list the assignments for each week at the beginning of that week so that you can better schedule your work.

 The projects will require heavy use of the computer and will be time consuming. Please, plan accordingly.

 Since the course assumes that you have mastered some ability to program, most of the programming activities will be part of your homework. However programming activity will be performed in class whenever possible and compatible with the lecture schedule.

- **REVIEW the graded Homework/Projects.**

 Homework and Projects will be graded and some difficulties will be discussed in class. Review the mistakes.

 Late Homework/Projects will not be accepted if returned after the solution is given or discussed.

 If you have difficulties doing your homework or your project please contact me or come to see me. **Do not procrastinate! Homework and Projects should be started immediately.**

- **Return work ON TIME**

 All the homework and project should be zipped and e-mailed as an attachment to aguercio@kent.edu **AND** a printed copy should be returned to the instructor as well.

 All the printed copies of the Homework or the Projects are due **before or at the beginning of class**. All assignments, either printed or submitted via e-mail, turned in one day late will get **3 points per day penalty** including those returned after the beginning of class.

 For all Homework or Projects that are e-mailed, the instructor will acknowledge the receipt within 24 hours via e-mail. The time of your e-mail will be compared against the work deadline. The reply is your receipt that the work has been turned in (not that it is correct!). If you do not receive a receipt, it is YOUR responsibility to contact me to see if the assignment has been lost in transmission. **Important:** once you submit your files **DO NOT OPEN THEM AGAIN!** If your e-mail didn't reach me or something happened to your files, I may need to ask you to resubmit your files by logging on in my presence to check the modification dates on your files and make sure that they haven't been modified after the due date.

What to expect to find in your Computer Science II class

- The class should be interactive. In-class exercises are designed to encourage participation. There will be cooperation between you and I, open discussions about problems and possible solutions. You are responsible for taking good notes. Handouts will be given only when necessary.
- You will be exposed to traditional lecture methods on the blackboard as well as PowerPoint presentations. You will participate in group activities and collaborative learning will be used to discuss possible solutions to problems as well as to provide critical observation to problem solutions. Formal and informal groups will be formed in class to work together. In some cases, you will be required to work on your own. In those cases, I expect appropriate academic behavior from you. Exchange of information, when forbidden, will not be tolerated.
- You will work both with and without a computer. When working with a computer (your homework activity) you will experiment hands-on with the concepts that have been covered in class. The projects are designed to complement the theoretical studies. Exercises of problem analysis, without the use of the computer, will reinforce the ability to strive for the optimal design of a problem's solution.

The Secret Key (not so secret after all!) of how to succeed in this CS class is to:

1. work conscientiously and do all the homework that has been assigned;
2. extrapolate, from the examples provided to you, techniques and answers to problems;
3. spend several hours at the computer to solve problems as well as reading material;
4. be alert and participate in class discussions;
5. learn from other people mistakes;

6. be critical of your own work. Question every step you are making; ask yourself “Is this step correct?” “Are there other easier or alternative and more efficient steps? Did I use the data structure in the appropriate way?”
7. attend class regularly;
8. spend time studying the theoretical concepts. Memory helps, but it is practice that reinforces the theory;
9. do all the above consistently through the whole semester, be confident about what you are doing and don’t be afraid to ask for help;
10. Think and enjoy!

I am very confident that you can make the above commitment and that you can maintain it during the semester. I am sure that you have all the ability to be successful!

Exams

-  There will be 2 100-points Mid-Term Exams which will cover the topics of the previous 5 weeks.
-  The 100-points Final Exam will cover the topics of the last 5 weeks of the course.
-  All exams are closed books, closed notes.
-  Retake exams are not available.
-  Make-up exams will only be given in case of serious need (written verification for your inability to take an exam is required) and only when I have been notified **prior** to the exam being issued, otherwise you are considered absent for that exam and the grade of your exam is automatically 0.

Grading

Your grade will be based on

1. Your homework
2. Your projects
3. Your participation in discussions concerning the homework and class topics
4. Your participation in class discussions about reading material
5. Your attendance in class
6. Your exams

Participation	5%
Attendance	5%
Homework and Projects	40%
Exam 1 and 2	30%
Final Exam	20%

Points	Grade
92.5-100	A
89.5-92.4	A-
87-89.5	B+
82.5-86.9	B
79.8-82.4	B-
77-79.8	C+
72-76.9	C
70-72	C-
60-69.9	D
00-59.9	F

Even though I have never found it necessary to change the grading distribution and the number of assignments and exams specified in the syllabus during the semester, I reserve the right to change the method of assigning grades, including changing the number of assignments or exams if I consider it necessary.

Course Withdrawal

If you are considering withdrawing from this course, please inform your instructor and consult a staff member in the Student Services Office, 134 Main Hall. Withdrawal from a course can affect financial aid, student status, or progress within your major. For withdrawal deadlines, please refer to http://www.registrars.kent.edu/home/TermUpdate/sche_adj.htm.

Academic Honesty Policy

When assignments must be individually and independently done, if some students turn in substantially the same solution or program of another student, in my judgment, the solution will be considered a group effort. All involved in the group effort homework will receive a zero grade for that assignment. Policy on academic dishonesty involving programming can be found at <http://www.cs.kent.edu/programs/grad/DishonestyPolicy.pdf>.

Use of the intellectual property of others without attributing it to them is considered a serious academic offense. Cheating or plagiarism will result in a failing grade for the work or for the entire course. Repeat offenses result in dismissal from the University. University guidelines require that all infractions be reported to the Student Conduct Officer on our campus.

Students with Disabilities

Kent State University recognizes its responsibility for creating an institution atmosphere in which students with disabilities can succeed. In accordance with University Policy Subpart E...104.44, if you have a documented disability, you may request accommodations to obtain equal access in this class. Please contact the disability coordinator on campus, Kelly Kulick in Student Accessibility Services, located in the Student Success Center, lower level of the Campus Center, phone (330) 244-5047, or kkulick@kent.edu. After your eligibility for accommodations is determined, you will be given a letter which, when presented to instructors, will help us know best how to assist you.

Classes Canceled – Campus Closings

Announcements of class cancellations and/or campus closings will be made on the campus home page. In the case of an emergency, weather-related or otherwise, please check the web page at <http://www.stark.kent.edu> for information on the buildings and times of the closing. While

information may be broadcast by radio and television, this should be confirmed by the web page, which is the official announcement of the campus and which will be the information used to determine issues related to student attendance, rescheduling of tests, and other concerns.

Conduct

Students and faculty behavior at the Stark Campus is governed by the guidelines set forth in *The Digest of Rules and Regulations*. That document can be found in the University telephone directory. Information can be found at the Office of Judicial Affairs at <http://www.kent.edu/administration/emsa/judicial.cfm>.

Recycling

KSU Stark Campus recycles. Recycling saves energy, which is currently generated by expensive and vanishing fossil fuels. Recycling one aluminum can saves enough energy to run a TV for three hours! Please take a few seconds to separate your trash. Aluminum cans and plastic and glass bottles may be placed in the blue recycling bins, and all types of paper may be placed in the blue recycling trash cans. All other waste may be placed in the black, brown or gray trash cans.

Important Dates to Remember

- Last day to withdraw **before grade W** is assigned, is Sept.13, 2009
- Last day to drop the class is Nov. 8, 2009
- Exam 1 - S. 1
- Exam 2 - Nov. 5
- Final Exam - Dec. 17 (3:30 pm – 5:30pm)

Thanksgiving Recess: Nov. 25 – Nov. 29

Classes End: Dec. 17, 2009

Tentative Outline of the Course

	Month/Day	Topic	Reading	Assignments and Deadlines
1	Sept 1	Introduction to Data Structures: A quick review of classes, constructors, member functions.	Ch 1 <u>Introduction</u>	HW1 <u>Deadline:</u> HW1 is due by Sept 8
2	Sept 3	Introduction to Data Structures: Strings Object Oriented Technique: Software Design	Read ahead Ch. 2	
3	Sept 8	Object Design Techniques		
4	Sept 10	Object Design Techniques/ Simple Search Algorithms	Read ahead Ch. 3	HW2 <u>Deadline:</u> HW2 is due by Sept 17
5	Sept 15	Operator Overloading. Selection Sort and Simple Search Algorithms		
6	Sept 17	Templates, Algorithms Complexity, Recursion: Fibonacci	Read ahead Ch. 4	HW3 <u>Deadline:</u> HW3 is due by Sept 24
7	Sept 22	Problems of the week 3		
8	Sept 24	Review and Practice	Read ahead Ch. 5	
9	Sept 29	Exam 1		
10	Oct 1	The vector Container		

11	Oct 6	The vector Container		
12	Oct 8	Pointers		
13	Oct 13	Pointers and Intro to Dynamic Memory: Vector		HW4 Deadline: HW4 is due by Oct 20
14	Oct 15	Dynamic Memory		
15	Oct 20	The Mini Vector example - The List container		
16	Oct 22	Iterators		HW5 Deadline: HW5 is due by Oct 29
17	Oct 27	Stack		
18	Oct 29	Stack		
19	Nov 3	Review		
20	Nov 5	Exam 2		Project to be issued
21	Nov 10	Queue	Read ahead Ch. 8 Read ahead Ch. 14 until p.810	Project issued. Deadline: due by 11:59pm - Dec 8 and presented in class on Dec 8
22	Nov 12	Priority Queues and Heap		
23	Nov 17	Linked Lists		
24	Nov 19	Linked Lists		
25	Nov 24	Linked Lists		
	Nov 25-29			
26	Dec 1	Trees		
27	Dec 3	Trees		
28	Dec 8	Project Presentation		
29	Dec 10	Review and Practice		
30	Dec 17	3:30 pm - 5:30 pm - Final Exam		