

**Cpt S 122: Data Structures**  
Course Syllabus

**Instructor:**

Nirmalya Roy,  
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Office Location and Hours:

**Coordinates:**

Time: MWF 12:10pm – 1:00pm (Sections 01, 02, 03, 04, 05, 06)  
Location: TODD 216  
EME 127, W & F 2:00pm - 3:00pm, or by appointment

**Course Description:** This course is about advanced programming techniques: data structures, recursion, sorting, searching, and basic algorithm analysis.

**Course Objectives:** At the end of this course, you should be able to:

- Apply and implement data structures
- Apply and implement several sorting algorithms
- Analyze algorithmic complexity
- Design, implement, and test a C++ program applying modern tools and technique
- Solve problems using the various data structures and algorithms and write programs for their solutions.

**Course Prerequisites:** Cpt S 121 (Program Design and Development) or an equivalent course.

**Tentative Course Schedule\*:**

Week	Monday	Wednesday	Friday
1	8/20 Introduction	8/22 Review Functions	8/24 Review Functions
2	8/27 Recursion	8/29 Pointers	8/31 Pointers
3	9/2 <i>No Class</i>	9/5 Characters & Strings	9/7 Characters & Strings
4	9/10 Linked Lists	9/12 Linked Lists	9/14 Linked Lists
5	9/17 Stacks	9/19 Stacks	9/21 Queues
6	9/24 Queues	9/26 Reviews	9/28 <b>Midterm Exam 1</b>
7	10/1 Trees	10/3 Trees	10/5 Trees
8	10/8 Classes and Objects	10/10 Classes and Objects	10/12 Classes: A Deeper Look
9	10/15 Classes: A Deeper Look	10/17 Operator Overloading	10/19 Inheritance
10	10/22 Polymorphism	10/24 Templates	10/26 Exception Handling
11	10/29 Abstract Data Types	10/31 Abstract Data Types	11/2 Review
12	11/5 <b>Midterm Exam 2</b>	11/7 Abstract Data Types	11/9 Abstract Data Types
13	11/12 <i>No Class</i>	11/14 Hash Table	11/16 Sorting
14	11/19 <i>No Class</i>	11/21 <i>No Class</i>	11/23 <i>No Class</i>
15	11/26 Sorting	11/28 Sorting	11/30 Algorithm Analysis
16	12/3 Algorithm Analysis	12/5 Algorithm Analysis	12/7 Review
17	12/12 <b>Final Exam, 1 pm to 4 pm</b>		

Note: \*Subject to change as the semester progresses

**Texts:**

- *C How To Program, Seventh Edition* by Paul Dietel and Harvey Deitel
- *Accelerated C++: Practical Programming by Example, 2000* by Andrew Koenig and Barbara E. Moo

## Course Requirements and Grading:

Quizzes	5%
8 Programming Projects	35%
2 Midterm Exams	20%
Final Exam	20%
13 Labs	20%

**Quizzes:** Quizzes will be given on most Wednesdays to ensure that material presented in lecture is understood. Please refer to the course schedule for quiz dates. All quizzes are written to assess basic understanding of material.

**Programming Assignments:** You will be given between 7 and 8 programming assignments to complete. Each one of these has been well thought-out and will guide you through solving a problem. I really hope that you view these assignments as a guide for learning the material and achieving the objectives presented in lecture. Also, note that all C/C++ code written in assignments must adhere to the recommended C Style and Coding Standards or recommend C++ Coding Standards; your TA will let you know if you are not adhering to these standards. Please upload assignments as attached .zip files to the corresponding “drop box” in ANGEL. Recall the site is <https://lms.wsu.edu/>. Please refer to the schedule for assignments and dates. All programming assignments must be submitted by midnight of the due date.

The programming projects would involve implementing the various data structures and algorithms discussed in the course. The programs must be written in Microsoft Visual Studio.

Instructions and due dates for the programming projects will be given in the project specifications. **No late programming projects will be accepted.** Please start working on the programming projects as soon as the project specifications are given. The first six-seven (6-7) projects are to be done individually while the last project is to be done in teams of three to four students each. Projects will be graded not only based on their correctness but also based on their overall design, good coding style, and proper documentation. By turning in the programming projects, you are certifying that the lines of code are your own work and were not copied from someone or somewhere else (e.g. Internet).

**Exams:** There will be two midterm exams and a final exam for this course. These are closed-notes, closed-books exams. You must take the exams at the official time and place. The exam coverage is cumulative, i.e. materials from the beginning of the course may be tested in either midterm or final exam. You may use calculators but not computers. By enrolling in this course, you are agreeing to the project due dates and exam schedules below. Forming or joining a study group is highly recommended to prepare for an exam.

The first midterm exam will be held during the sixth week of class (Friday, September 28) and the other will be held during the twelfth week of class (Monday, November 5). All midterm exams will be held during the class (50 minutes). The final exam will be held on Wednesday, December 12, 1:00 pm - 4:00 pm in our normally schedule classroom. You will NOT be allowed to use cheat sheets in this course. You need to be more accountable for retaining the information taught in the course.

**Labs:** You will be given 13 labs to complete. Each lab will give you hands-on experience with using the C/C++ language to solve multiple problems. These weekly lab assignments also give you the opportunity to put into practice the techniques and concepts covered in the lectures under the supervision of a trained and knowledgeable teaching assistant. You are encouraged to share ideas with your peers in lab. Take advantage of learning from each other. You will receive good credit for a given lab if (a) you show up and actively participate in the entire lab by making a sincere effort to complete all of the problems; and (b) you make a sincere effort to assist other students with the lab in the event that you finish before them. Hence, you are awarded credit in lab for participation and effort. You may make up some labs if you have an excuse that is acceptable as determined by the instructor and/or TA. If a lab happens to fall on a holiday, then you are expected to complete the lab on your own or attend another lab section for that week.

You are responsible for ensuring you receive appropriate credit from your TA for these special circumstances.

**Participation:** You are expected to attend and participate in lectures and laboratories regularly. Attendance may positively affect your grade at the end of the semester.

The URL for the course webpage is <http://eecs.wsu.edu/~nroy/courses/cpts122/>. This course will also use the Angel Learning Management System (LMS) (<http://lms.wsu.edu>) this semester. You are responsible for regularly consulting the course webpage and the LMS for any course announcements or updates.

**Cheating:** Anyone cheating on work in this course will receive a failing grade for the work and will be subject to the university's academic dishonesty policy. Cheating involves giving assistance or receiving assistance on work assigned in this course. If you have any questions regarding a homework, project, or exam, see the instructor or teaching assistant. The Washington State University statement on academic integrity can be found at <http://www.eecs.wsu.edu/~schneidj/Misc/academic-integrity.html>.

If you require an accommodation based on disability, I would like to meet with you in my office, during the first week of the semester, to make sure you are appropriately accommodated.

Please visit the University's Office of Emergency Management website <http://oem.wsu.edu/Emergencies> to be familiar with what to do in the event of emergencies.

If you have any questions or concerns about this course, please feel free to e-mail or to talk to the instructor or teaching assistant. When sending e-mails to the instructor, please put **[CPTS122]** (including the square brackets) as the first nine (9) characters of the subject heading.