# CS 2420

**Division:** Natural Science and Mathematics
**Department:** Engineering and Computer Science
**Course:** CS 2420
**Title:** Data Structures and Algorithms
**Catalog Description:**

This course covers data structures and algorithms in some depth. Topics include data structures, recursion, problem solving strategies, and complexity analysis. Sorting and searching algorithms are covered in detail.

**General Education Requirements:** N/A
**Semesters Offered:** Fall
**Credit/Time Requirement:** Credit: 3; Lecture: 3; Lab: 0
**Clock/Hour Requirements:** 0
**Offered for Non-Credit:** No
**Prerequisites:** CS 1410

**Justification:**

This course is part of the recommended curriculum for computer science majors at Snow College. This course follows guidelines for a "Data Structures and Algorithms" course outlined in *Computing Curricula 2001*, The Association for Computing Machinery, 2001

**Student Learning Outcomes:**

Students will know many basic data structures, recursion, complexity analysis, and common sorting and searching algorithms.

Students will be able to use appropriate data structures and data abstraction. They will be able to use recursion as a problem solving strategy. They will be able to analyze complexity of algorithms and use appropriate sorting and searching algorithms.

**Content:**

The following topics will be covered in this course:

- Linked lists
- Stacks and queues
- Trees
- Tables
- Graphs

- Recursion
- Complexity analysis
- Sorting and searching

**General Education Outcomes:**

1) Read effectively, constructively, and critically.
Students will read the text throughout the course. They will also be required to read and understand specifications of problems assigned as homework so that a solution can be developed. For example, a written description of a program will be given. The student will be required to read the description, understand what is expected, and then produce an appropriate program.

4) Retrieve, evaluate, interpret, and deliver information through a variety of traditional and electronic media.
Students will be required to utilize the text, application software help material, and online information to produce software solutions to many assigned problems.

7) Apply scientific reasoning to a variety of contexts.
Students will be able to approach problems logically and develop solutions by applying the software development process. This will include understanding the problem statement, developing a algorithmic solution, and verifying the solution.

**Key Performance Indicators:**

Homework exercises: 10%-20% of final grade

Programming projects: 15%-25% of final grade

8-10 quizzes: 10%-20% of the final grade

3-5 examinations: 25%-55% of the final grade

Comprehensive final examination: 15%-25% of the final grade

**Representative Text and/or Supplies:**

F. Carrano and J. Prichard, *Data Abstraction and Problem Solving: Walls and Mirrors*, current edition, Addison Wesley

**Optimum Class Size:** 20
**Maximum Class Size:** 30

**Signatures:**

I hereby submit this course syllabus:

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I hereby find this course consistent with the goals and resources of the Engineering and Computer Science Department:

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Garth O. Sorenson, MS, Associate Professor, Chair

I hereby find this course consistent with the goals and resources of the Natural Science and Mathematics Division:

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Dan Black, EdD, Associate Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

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Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

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Michelle Olsen, MLS, Campus Librarian (Richfield Campus)