Designing an efficient algorithm for some purpose is a creative activity akin to solving a puzzle or proving a mathematical theorem. We will focus on this design process, and also survey the mathematical tools that can be used to evaluate the efficiency of algorithms.

Examples will be drawn from a variety of topics: sorting and searching, algebra, graph theory, geometry, string processing, etc. Aside from their inherent interest, these examples form the basic “toolkit” of practical computing.

At the end of the course, we will study inherent limits to the efficiency of algorithms. In particular, we will take up the question of whether there are computational problems that are inherently intractable.

Prerequisites.
You should know the material from data structures (CS 367), calculus (Math 221), and discrete math (CS/Math 240).
Informal prerequisites include a healthy intellectual curiosity and a willingness to work hard to solve problems.

Texts.
Other books will be put on reserve at Wendt Library.

Grading.
Based on homework assignments, a midterm examination, a final examination. The midterm exam will be the evening of Wednesday, March 16, in 1361 Chemistry. The final exam is Wednesday, May 11, 12:25 PM, in 113 Psychology. Each component will have roughly equal weight.
There will be 9 problem sets, with due dates February 3, 10, 17, 24, March 2, 9, and April 13, 20, 27 (all Wednesdays). Since we have a large class, your homework should be done with a partner. Please put both your names and student ID's on whatever you turn in.
Your work will be graded on content and clarity. Any instances of plagiarism, copying, or encouragement thereof will be referred to the University's academic misconduct board.
Please understand that your grade represents my judgment of how well you have learned the material in this course.

Style.
I will try to put the entire course on the board. Make sure you take good notes.
Office hours are a great opportunity for discussing the class material in an informal setting; please take advantage of them.
E-mail to students will be sent via the “classlist” utility. Please check that your mail is being appropriately forwarded.
The course web page will be at

http://pages.cs.wisc.edu/~cs577-1
The 577 courses will share a Piazza discussion board. To sign up, go to

https://piazza.com/wisc/spring2016/cs577