Course description/prerequisites  Introduction to general problem-solving techniques applicable to solving problems in computing, including elementary computational problems. Other techniques include using systematic lists, using diagrams, and looking for patterns. Includes fundamental computational concepts in information representation, computer organization, and social and ethical issues in computing. The two-hour lab introduces the use of software to solve a variety of problems. The prospective student should have a general understanding of computers and their operation. Prerequisite: Successful completion of MATH 0800 with a grade of B or better, or three years of high school mathematics (including two years of algebra) and a score on the Mathematics Placement Test appropriate for placement into MATH 1170.

Course objective: The goal of this course is to enhance your problem solving abilities. In particular, I will help you to develop numerous problem solving tactics and understand how to use them, and you will use those tactics to solve simple problems involving computing and computers. An additional goal of this course is to provide you with an overview of the discipline of computer science and the fundamental ways that computer scientists view problems and their solutions. Computing solutions to problems are typically expressed as algorithms. You will learn elementary techniques for expressing solutions to computing problems as algorithms.

Student learning outcomes: This course fulfills requirements for the Computer Science and the Computer Information Sciences Majors and Goal Areas 2 and 4 of Liberal Education. See https://www.bemidjistate.edu/academics/catalog/20203/content/468 This course introduces material germane to Computer Science Learning Outcomes 1, 2, 3, 4, and 6. See https://tinyurl.com/yxm4ajke The course introduces material germane to Computer Information Systems Major Student Learning Outcome 4.

Students who successfully complete CS 1309 will be able to:

- use at least six different problem solving techniques;
- use small group settings to solve problems;
- clearly express solutions in a logical way in writing;
- express why a solution to a problem is valid and correct;

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• understand the distinction between syntax and semantics as it relates to computation;
• articulate value assumptions that underlie and affect decisions related to computation and communication technologies;
• apply contemporary languages to the solution of simple computation problems (i.e., express solutions to problems as processes);
• build models of simple contexts and express those models in a contemporary programming language; and
• understand the source of the complexity of computational solutions through a deeper understanding of the design of computational and communication systems.

Course schedule: The list of topics, additional class preparation material, lab preparation material, and class schedule are all found in D2L. Note that there is material for you to read and questions for you to ponder for almost every class period.

Grading for the course: There are three main aspects of the course: the problem solving aspect, the computer science aspect, and the lab aspect. With respect to the problem solving aspect, you have two problem solutions due each day that lecture is scheduled to meet. Each problem will be worth up to three points: three points for a correct solution arrived at by a thoughtful methodology, two points for an incorrect solution arrived at by a thoughtful methodology, one point for a correct solution. You will be given two opportunities to present your solutions to the class. The first time you do so, you will earn five points, the second time you will earn five points. Additionally, there will be regular graded in-class group work that will be part of the problem solving aspect. This in-class work will often be graded. There will be one essay assignment (50 points). The lab aspect will consist of up to fourteen lab assignments. They will be assigned during lab time. Furthermore, you will be given guidance on their completion during lab. Each lab will be worth 10 points.

The first midterm exam (100 points) will be on Wednesday, October 2, 2019. The second midterm exam (100 points) will be on Wednesday, November 6, 2019. The comprehensive final exam (200 points) will be held on Monday, December 16, 2019 from 10:30 a.m. to 12:30 p.m. Note that I consider the final an extremely important evaluative tool. If your score on the final exceeds the sum of your scores on the two midterms, I will replace the sum of your scores on the two midterms with your score on the final. Also, final exam scores weigh heavily in determining final grades of those on the borderline. Note that if you are on the borderline and have not done both problem presentations I will not move you to the higher grade. I determine final grades on the basis of what you learn so you must strive to learn the material as well as you possibly can. My performance, the difficulty of the exams, labs and assignments, and your performance all enter into the final process of determining grades.

Thus, there will be 700-800 points over the course of the semester. If you get more than half of the total points plus half the lab points, you will earn a C or higher. The A and B cutoffs will be set at approximately 1/3 and 2/3 the distance between the high score and the C cutoff, depending on a variety of factors. I do not use the +/- grading system. I will clarify this process after each of the midterm exams and again before the final exam.
Course Requirements: You must complete the writing assignment and all lab assignments and the final exam before you will be eligible for a passing grade in this class. Note that completing all of the components does not guarantee a passing grade.

Each assignment is due at the time and day listed on the assignment or at the beginning of the class on its due date. You can (and must if you wish to be eligible for a passing grade) turn in items after the due date/time. However, labs turned in after the due date and time will receive a score of no more than 5 if I have begun the grading process. The writing assignment turned in after the due date and time will receive a score of no more than 25 if I have begun the grading process.

Note that I will accept daily problems after their due date, provided that each is clearly identified as to which daily problem it is and the day that it was due. Each late daily problem is worth at most two points.

You should begin work on daily problems before they are due. By starting early, you have the opportunity to ask me to clarify those things you do not understand. The most common reason for failing this course is not doing the daily problems. Note that the final exam also serves as the make-up exam for one or both midterm exams.

If you are having difficulty with any aspect of this class please talk to me in a timely manner. I will do my best to deal with your situation. More options will be available to us if you approach me as soon as possible.

As a student in this class you are expected to spend a substantial amount of time learning and pursuing knowledge. Learning is not an easy process. As a guideline you are expected to attend class three and a half hours per week and spend at least five and a half hours per week either studying, reading or working on problems. This means an out of class commitment of over 80 *quality* hours over the course over the next seventeen weeks. Plan to spend this much time!

It is essential that you commit yourself to regular studying. Without a consistent effort you will not meet deadlines and you will not find the assistance from me you need to complete problem sets and programming assignments.

Assignment guidelines: Anything you turn in to me must be neat and readable. You should hand write them, except that the essay must be submitted electronically. I will not grade what I cannot read. Exams must also be written neatly. I will not score parts I cannot read.

Labs will be turned in electronically. The writing assignment must be submitted both in paper form and electronically. Each assignment will contain instructions on how it is to be submitted.

Academic Honesty: Please be aware that the University’s policy for Academic Integrity appears in the Student Code of Conduct. I expect that you have read this material. If you do not understand what is meant by this policy, or if you are confused by terms such as plagiarism, cheating, or collusion, please discuss this policy with me, your advisor, or another faculty member as soon as possible. I absolutely require that you fulfill your academic obligations in a fair and honest manner. This includes turning in work that is uniquely yours, unless I explicitly require you to work on a project in a group.

To this end, any two or more students who turn in work that looks even remotely similar will be given at most half credit for the work (i.e., I will grade it once and split the points among those students presenting similar work). I strongly suggest that if you work with others you only work together in the idea generation phase and that when it comes to writing or typing your work, you
do so independently. It is in your best interest to never look at any solutions written by another student and to never let another students see any solutions you have written. If you do turn in work that I suspect is the result of cheating, I reserve the right to carry out the sanctions listed in the Student Guide.

Specific items that I consider cheating on programming assignments or problem sets are:

1. Turning in someone else's work as your own (with or without that person's consent). This includes turning in a copy of something that can be mechanically transformed into a copy of someone else's work. Don't even try to disguise cheating by simply modifying someone else's work and calling it your own.

2. Allowing someone else to turn in your work as his or her own work. This includes allowing fellow students access to your electronic copy.

3. Using a solution developed by a student in a previous term.

4. Using a solution found in a book or journal article or on the web.

**Class participation:** Do not miss class. I try to present material differently than it is presented in the text in order to give you an additional point of view. Furthermore, you will miss out on the opportunity to practice what is being taught. You are responsible for all announcements and material covered in the event that you do miss class. I am not a source for that information. You must get it from one of your classmates.

Attendance at lab and completion of lab work is mandatory. Furthermore, if you miss $n \geq 3$ labs your grade will be reduced by $n - 2$ full letter grades.

In addition to attending class, you are required to participate in class. Reading the material in D2L ahead of time is required. Participation involves following the lecture, asking questions, answering questions, and working in assigned groups on problems.

In the event of snow, I will hold class unless the university cancels classes or closes. If you must travel, it is your responsibility to use good judgment as to whether to attend that day.

**Notice:** BSU is committed to making all educational programs, course materials, services and activities sponsored by the University accessible to individuals with disabilities. Students requesting accommodations due to a disability or other need for access should contact Accessibility Services as soon as possible. Accessibility Services is located at Decker Hall 202. PH: 218.755.3883 or email: accessibility@bemidjistate.edu. This information is also available through Minnesota Relay Services at 800.627.3529.