Course objectives: This course is meant to provide a mathematical basis to understand the technical material often found in computer science practice, textbooks, advanced coursework at HWS, and beyond. It is understandable how it happens but incorrect to assume computer science is about specific machines (PCs, laptops, servers, etc), or software (Windows, Linux, or Macintosh OS, gcc, Eclipse, MySQL, etc). This course is not about transistors, CPU architecture, specific programming languages, compilers, or currently available hardware. Instead, the topics we will cover are timeless in the sense that they were the foundations from which computing arose and which underlies all modern computing today. Trying to produce a specific solution to a programming or design problem is best approached with a full toolbox of techniques, many of which are based on the sorts of abstract ideas we will be encountering in this course. Until Boolean logic and mathematics are no longer the basis of computation, this material will remain what computer scientists of all types hold in common.

Class format: We will be mixing some traditional lectures on the theory with some sessions on applications. Most of this material is about the theory so we will spend the majority of time doing things of a mathematical and logical nature. I tend not to make classes into 55 minute speeches so expect me to ask you questions and be ready to offer solutions to problems, explain how you understand a specific technique, do a presentation, etc in class.

Prerequisites: You should have successfully completed at least one course in programming such as CPSC 124. We will not be designing complex programs in Java, or your own favorite programming language, but instead you will write some fairly simple programs to test the concepts in our course. Computer programs are excellent tools for testing out ideas by writing a small program to create a simple grammar, parse some text using that grammar, investigate recursion via Prolog, simulate a finite state machine or pushdown automata, etc. If you are a bit rusty, review how to write, compile, and run a simple Hello World application in your favorite programming language.

Background in mathematics through high school algebra is assumed. If you have some Calculus, that is also good but we will not be using any specific information from Calculus. I will try to indicate in advance if any non-elementary methods not covered in the text are needed to work various problems.

Texts: The text we are using was written by Carol Critchlow and David Eck. Most of this book is a reflection of how computing owes its beginnings to logically minded people and this remains true today. The material is detailed but not intellectually overwhelming. What you cannot do is just wave your eyeballs over the words. Although slower and more tedious, carefully reading the material, thinking it over, working out an example or two, and generally absorbing it methodically is really the only way to get it.

The text is available as a free-to-download PDF on our course website, David Eck’s website, and can be downloaded or purchased from lulu.com as a bound book. It is your choice but see the comments about class etiquette below.
**Homework:** You will receive a list of homework exercises every week in class. Homework problems are usually due at the beginning of the next week. **No late homework will be accepted for grading.**

**Period.** I will drop the lowest homework grade to accommodate for illness, faulty alarm clocks, and other emergencies which are part of life.

**Attendance:** There are enough distractions in your life so don’t add to them by using your phone in class. Put your phone away until class is over. If you need to use the toilet, do so before class begins or after it ends! If you want to use your laptop to read part of the textbook in class, that is fine but do not drift off into online distractions. Put your laptop away if you are not using it for this course right at the moment.

You cannot get the most out of this class experience if you do not participate, especially when it comes to attending class. Missing two or more classes by unexcused absences will result in a reduction of your final grade by at least one letter grade. Missing more means more reduction. Enough said?

**Exams:** There are three written exams in this class. Two midterm exams are on **Monday September 29th** and Monday **November 3rd.** All midterm exams are in-class lasting 55 minutes with take-home problems given in advance and due the day of the exam. The final exam is on **December 16th at 1:30-4:30 pm.** Do not make any travel plans without consulting these dates beforehand. The I will provide more information on the exams as they approach.

**Grades:** Your grade in this class will be determined by your accumulated point total from homework (140 points), exams (300 points), and class participation/attendance (50 points). The exact number of points depends on the number of homework sets assigned.

**Disability Accommodations:** If you are a student with a disability for which you may need accommodations, you should self-identify and register for services with the Coordinator of Disability Services at the Center for Teaching and Learning (CTL), and provide documentation of your disability. Disability related accommodations and services generally will not be provided until the registration and documentation process is complete. The guidelines for documenting disabilities can be found at the following website: [http://www.hws.edu/academics/ctl/disability_services.aspx](http://www.hws.edu/academics/ctl/disability_services.aspx)

Please direct questions about this process or Disability Services at HWS to David Silver, Coordinator of Disability Services, atsilver@hws.edu or x3351.