The general goal of this course is the study of computable functions. We present several equivalent definitions of this concept: functions computable by programs, functions defined inductively from simpler functions, functions computable by Turing machines, etc. In the process of discussing these equivalent definitions we will establish fundamental properties of computable functions and examine limitations of this concept. This course is mathematical in nature and requires that you master techniques and ideas typically taught in a Discrete Mathematics course (classes of functions and relations, proofs by induction, enumerability, etc).

The main source for the course are the lectures and the *Computability, Complexity, and Languages* by M. D. Davis, R. Sigal, and E. J. Weyuker, Academic Press 1983, second edition. The book is available free on the Internet or can be ordered on-line.

We will cover in this course the following major topics:

- Programs and Computable Functions
- Primitive Recursive Functions
- Universal Programs
- Strings and Turing Machines

This course will require several homeworks assigned every other week. This document and any other information (homeworks and handouts) will be posted on my web site [www.cs.umb.edu/~dsm](http://www.cs.umb.edu/~dsm). Look to this page often! Each lecture will have a set of slides posted on my web page.

Homeworks have to be submitted on-line, presented neatly and clearly, with no grammatical or spelling errors. What you understand well you can express well. I require you to learn LaTeX and to use it for your homework. The grade for this course will be determined by the homework grades and by your class participation.

**No late homework will be accepted** unless you get permission from me ahead of time and have compelling reasons. It is OK to discuss your homework with colleagues and with me, of course. However, the homework must be your own product. Plagiarism and unethical behavior will be severely sanctioned according to the code of academic conduct.

My office hours are Monday and Wednesday 3:00-4:00pm via ZOOM. If you wish to contact me for an office hour appointment send me mail at Dan.Simovici@umb.edu and I will send you a ZOOM invitation.