

Course Outline: Math 4/5/7380, Spring 05

The web page for this course can be found at <http://livetoad.org/>. Please check there frequently for announcements, changes, due dates, solutions, scores, and other goodies.

Introduction

Welcome to Discrete Structures and Analysis of Algorithms! As the course title suggests, the syllabus for this course is the union of two topics (formerly taught in separate courses, back in the days of quarters). Discrete structures stand in contrast to the continuous structures you study in courses such as calculus. Finite mathematical structures are discrete, as are the structures of integer and rational arithmetic. Algorithms are step-by-step procedures. An example of an algorithm is the recipe for long division. Algorithms are intimately tied to discrete structures. They are best studied together.

Quizzes

There will be a short, 5-point quiz nearly every day, based on reading assignments I will post on the web. Your 20 best quiz scores will count towards your final grade. I will not give make-up quizzes under any circumstances. If you miss a quiz then that will be one of the scores you drop.

Exercises from the text

There will be 13 exercise sets, taken from the text. No matter how many problems I assign, I will randomly choose 10 to grade, and so each set will be worth 10 points. I will post the assignments and due dates. I will not accept exercises past the due date. Your 10 best scores will count towards your final grade. If you do not submit an exercise set by the due date then that will be one of the scores you drop.

You can find the answers to the exercises in the back of the text. For this reason, your scores will not depend on the answers, but on the clarity and accuracy of your explanations. Some of the exercises ask you for a complete proof. Some will ask you to elucidate an example. Some will ask you to find the flaw in a putative proof. *All* exercises require complete sentences. You will not get credit for a solution if you are vague or if you omit important details.

Your homework must be neat and show all work. When you turn in your homework fold the papers lengthwise and write on the outside

your name, Math 4380, Spring 05, assignment number, due date

Computer labs

There will be 6 computer lab, each worth 10 points. Each lab will require you to study code, explain how it works, and write similar code. I will post the code and due dates. You may replace an exercise sets with a computer lab report, or you may choose not to turn in the computer lab report for grade. Each computer lab will allow at least 3 weeks before the due date, and so you will have plenty of time to work on the lab before you decide whether to turn it in for grade. I will not accept lab reports past the due date.

Python

The computer labs will use the programming language *python*. This will also be the language we use in lectures and on the exams when we discuss algorithms. Python is perhaps the easiest language to learn, but it is also very powerful. It is easy to learn even if you have never done any computer programming. There is a good online introduction to python, called *How to Think Like a Computer Scientist*, by Downey, Elkner, and Meyers, and available online at <http://www.ibiblio.org/obp/thinkCSpy/>. This tutorial does *not* assume you know anything about programming. One of the nice features of this tutorial is the glossary of terms at the end of each section.

Altho I do not assume you know anything about computer programming, and in particular I do not assume you know the language python, I know from experience that you will not learn the material in this course, and you will not do well on the exams, unless you try to implement for yourself some of the algorithms we study. Experimentation — and the many mistakes and false starts that implies — is an inimitable learning tool. Do not be afraid to experiment, to make mistakes, and to learn.

At any rate, python is the language of choice in this class. On the exams I will expect you to be able to read and write correct python. You will lose a significant number of points for incorrect python syntax.

Python is available in the math computer lab, UH 1000. I believe the version installed there is 2.3, and so that is the version we will use in class. The latest version available is 2.4, and there are some significant differences between these versions. If you have your own computer then you should take the time to download and install python yourself. It is free. It is easy. Go to <http://python.org/>.

Plagiarism

I encourage you to work together. Studies show that students who work together consistently out-perform those who do not. However, your own work must be written in your own words. Do not “divide up the labor”. Do not copy from one another. Copying is cheating, and can result in your getting an F in this course. If I see two or more lab reports with portions which are identical or nearly identical to one another, then each of these reports will get an F, no matter who copied whom. If it happens a second time you will get an F in the course.

Exams

We will have two exams, worth 100 points each. The exam dates are listed on the calendar below. The exam questions will be similar to those found on the quizzes and homework assignments. Some may require proof. Some may require that you write or analyze python code.

I will give make-up exams only in case of a documented exigency, such as illness or a funeral. If you are sick the day of the exam then you must call or email that same day if you expect to be able to make up the exam. Otherwise you must arrange for a make-up exam ahead of time. If I am not in my office then you can leave a voice mail message. If you fail to show up for an exam and do not contact me about it until afterwards then you will not be able to make up that exam — you will get a 0 for that exam.

Grades

Your final grade will be determined from the distribution of total points earned. I will post the class histogram, and this should give you a clear idea of where you stand. Historically 85% of total points earns an A; 75% earns a B; and 65% earns a C. However these are just historical observations, not rigid targets.

If you want me to post your scores under a nickname then bring me a 3×5 card with your name, an email address, and the nickname you want to use — preferably something not obvious! I will not accept email requests to email or post your scores or final grade. If you want me to post your scores then you must bring me a 3×5 card.

If you stop attending class then I will give you an IW grade. There are two points during the semester for submitting IW grades: the 4th and 10th weeks. After the 10th week an IW grade is impossible, so if you stop attending after this point then you will get an F.

Office hours

My office is UH 4080e. The phone number is 419 530 2975. My email address is simply paul.hewitt, at utoledo.edu. My office hours for this class are Tuesday and Thursday before class. Before class I will be in the Rocket Hall lobby. After class I will be in my U Hall office. At these times you can call or stop by without an appointment and I am sure to be there. I am also available at other times, but for these you must make an appointment. Feel free to ask for appointments at other times if you cannot make it to my regular office hours. If you call me when I am not in my office then you can leave a voice mail message and I will get back to you as soon as I can.

Calendar

<i>ML King Day</i>	Mon	17 Jan
Exam 1	Thu	3 Mar
<i>Last Day to Withdraw</i>	Fri	4 Mar
<i>Spring Break</i>	Mon–Fri	7–11 Mar
Exam 2	Thu	5 May, 17:00–19:00