

Brief Syllabus of COSC 4301-04/5314-01, Summer I 2005
Logic and Discrete Structure for Computer Science

Mon ~ Fri, 9:35 ~ 10:55 PM, Maes 111

Instructor: Dr. Chung-Chih Li
Office: Maes 69, Tel: (409) 880-8748
E-mail: licc@hal.lamar.edu Class URL: TBA (if any)
Office Hours: MWF 11:00 ~ 11:50 AM

Description of the course and Topics:

It's not over exaggerating to say that the entire enterprize of computer science stems from the study of logic. Not only that writing programs itself is a logical process but that every useful theorem in computer science is an analytical result deducted from a few accepted axioms. In other words, no knowledge in computer science should be treated as an empirical result (well, the *Church-Turing Thesis* is the only exception I can think of; but that thesis has deeply touched the limitation of our logical system.) Unfortunately, under the pressure from the present computing industry that usually requires immediate results to be promptly delivered, we have observed that many students majoring in computer science wrongly consider that the ability of analytical reasoning is irrelevant to their future careers. Here what they might do: take a problem, write a program, observe the program running, and claim the correctness of the program. Inexperienced programmers incline to handle abstractness involved in their programs by intuition, but too often our intuition turns out wrong. Here what a programmer should do: take a problem, assess the problem, write a program, analyze the program, check the results, and figure out a proper domain of the program. All these processes require a nontrivial skill of handling mathematical notations, deductions, proofs, and arguments in a rigorous way. Beside this immediate application, a computer science major needs to learn the underlying theories that govern the computer. You also need certain mathematical maturity to comprehend these theorems in your future study. Thus, this course is designed to equip you necessary mathematical background so you can understand and present your own works. Topics to be included but not limited in this class are: Sets, Logic, Functions, Relations, and Mathematical Inductions.

Textbook:

Discrete Structures, Logic, and Computability, by James L. Hein, Jones and Bartlett Publishers, Inc. 2002, Second Edition.

We will try to cover most topics from Chapters 1 to 9 of the textbook.

Examinations: (400 points)

Two midterms (100 points each) and one Final (200 points)

Homework, Pop-quizzes, and Attendance: (200 points)

Practice and practice is the only way to build up your mathematical muscle. I will try to give you homework everyday. They will not be graded, but in the next class after the homework is given, each problem of the homework needs a volunteer to write down his/her *complete* answer on the blackboard *before* I come to the class. I will spend 10 minutes or so to grade them and point out the mistakes, if any. The volunteer will get extra credit up to 10 points for each problem. (Students should take turn for the extra credit!!) Also, I will give pop-quizzes and take attendance impulsively; each worth 10 points.

Grading Policy:

Your points will be accumulated and the grade is based on the following scheme.

Points	Grade	
540 ~	A	Excellent
420 ~ 539	B	Good
300 ~ 419	C	Satisfactory
200 ~ 299	D	Passing
0 ~ 199	F	Failure

I do not curve!!