

Course Description

Professor	Dr. J.K. Johnstone, CH125
Time	TTh 11-12:15, CH430
TA	Song Gao (gaos@uab.edu)
Office Hours	Johnstone: MW2-3 or by appointment (24 hours notice), CH125 Gao: MW9:30-11, Th3:30-4:30, or by appointment, CH128
Prerequisites	CS201 and MA105 (with grades of C or better in both)
Textbook	Judith Gersting (2007) <i>Mathematical Structures for Computer Science</i> , 6th edition, W.H. Freeman (New York).
Website	www.cis.uab.edu/cs250/

The major topics of this course are formal logic (namely, propositional logic and first order predicate calculus), elementary set theory, proof techniques, relations, functions, graphs, and counting. These topics lie in the area of discrete mathematics, which is a foundation for most of computer science. Artificial intelligence is one of the natural applications. Formal languages, such as programming languages, are another.

There are many excellent resources for our topic, beyond the textbook.

Additional References

- Edward Scheinerman, **Mathematics: A Discrete Introduction**, Thomson, 2nd edition, 2006.
- David Gries and Fred Schneider, **A Logical Approach to Discrete Math**, Springer, 1993.
- L. Lovasz, J. Pelikan, and K. Vesztergombi, **Discrete Mathematics: Elementary and Beyond**, Springer (New York), 2003.
- Stuart Russell and Peter Norvig, **Artificial Intelligence: A Modern Approach**, Prentice Hall (Englewood Cliffs), 3rd edition, 2009.
- Douglas Hofstadter, **Gödel, Escher, Bach: an Eternal Golden Braid**, Vintage (New York), 1979.
- D. Solow, **How to Read and Do Proofs**, John Wiley (New York), 1982.
- Richard Jeffrey, **Formal Logic: Its Scope and Limits**, McGraw-Hill (New York), 1967.
- W. Clocksin and C. Mellish, **Programming in Prolog**, Springer-Verlag (Berlin), 1981.

Grading

Homework	30%
Classroom participation	5%
Midterm 1 (Thursday, Feb. 4, 2010, closed book)	15%
Midterm 2 (Thursday, March 11, 2010, closed book)	20%
Final (2C slot, Thursday, April 29, 10:45am-1:15pm, closed book)	30%

Because of the crucial importance of attending class, I am giving you an incentive. If you miss 5 or more classes, you will receive a 1% penalty (on the final grade) for each class that you miss. To expedite roll, please sit in your standard seat. Please note that arriving late is equivalent to a miss.

Last day to withdraw with 'W': March 5, 2010.

Curriculum

1. propositional logic [1.1-1.2]
2. first order predicate calculus [1.3-1.5]
3. elementary set theory [3.1]
4. proof [2.1-2.2]
5. relations, functions [4.1, 4.4, 4.6]
6. graphs [5.1, 6.2, 6.4]
7. counting [parts of chapter 3]

Homework	Probable topic	Probable due date
HW1	logic	January 19
HW2	logic	January 28
HW3	sets	February 18
HW4	proofs	March 4
HW5	relations	April 1
HW6	graphs and counting	April 15

Homework is due in class, at the beginning of class. Late penalty is 10% per day; however, note that the homework must be handed in before a homework solution is handed back, which usually means you have until the next lecture. (Homework is typically due on Thursday and returned by the next Tuesday.) Late homework should be handed in to the department office (Campbell 115), with a secretary's signature acknowledging time and date of receipt. Homeworks will be marked by the TA. I will mark all exams and create all solution sets for the homework (which are followed in marking the homework). I will drop your lowest mark on these homeworks. Every homework is weighted equally. In general, the marking scheme for this class will be as follows: A = 90-100; B = 80-89; C = 70-79; D = 55-69; F = below 55. These standards may be adjusted for certain exams or homeworks.

Attendance policy

You are expected to attend every class: it will be difficult to pass the course otherwise. If you must miss a class because of illness or other unavoidable reason, you are responsible for getting the notes and any assignments from a fellow student.

Please arrive on time. Often the first 5 minutes of class are the most important 5 minutes, as the lecture material is introduced and important administrative issues are discussed.

Attending class means actively attending class. Please, no cell phones and no use of the computers.

Honour code

All of the following are strictly forbidden:

- Any form of cooperation on exams, whether take-home or in-class.
- Any form of cooperation on homework, other than preliminary oral discussion at a high level (that is, definition of the problem). Homework is to be solved and written up alone and independently.
- Any coercion of other students to help on homework or exams (even if help is not forthcoming).

All references and/or websites used must be included in a bibliography. Care must be taken not to plagiarize.

Violations of any part of this honour code will result in a 0 on that exam/homework, possible failure of the course, and possible forwarding of the case to the school ethics board, where a decision about expulsion from UAB is made.

Makeup policy

Midterm exams can be made up if missed due to illness, upon receipt of a doctor's note. The final exam cannot be made up. The final exam cannot be offered to students early (e.g., for Christmas travel).